PROCEEDINGS

OF THE

MADRAS GOVERNMENT

IN THE

PUBLIC WORKS DEPARTMENT,

IRRIGATION BRANCH,

FOR THE

MONTH OF NOVEMBER 1894.

Printed by Authority.

MADRAS:
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1894.

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GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

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GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

READ—the following papers :—

From the Superintending Engineer, II Circle, dated 2nd December 1893, No. 2140 K.S.
To the „ „ „ „ 6th „ „ „ 205 K.S.

From Major W. L. C. BADDELEY, R.E., Superintending Engineer, II Circle, to the Chief Engineer for Irrigation, dated Bezwada, 11th October 1894, No. 1563 K.S.

With reference to your memo. No. II/205 K.S., dated 6th December 1893, I have the honour to inform you that the Executive Engineers state that no savings can be expected on any of the sub-heads of the estimates embodied in G.O., No. 857 I., of the 11th October 1893, and that as no extension of irrigation was under contemplation when preparing the completion project estimates of the Kistna delta, no provision was made for works such as the one under reference.

2. As it is reported that more than 1,000 acres can be brought under wet cultivation if the sluice and channel in the left bank of Pulleru canal for which estimates amounting to Rs. 1,280 were sent to you with this office letter No. 2140 K.S., dated 2nd December 1893, are sanctioned and work executed by next season, I request the favour of early sanction to the estimate from the balance available for unforeseen works. The amount for which sanction is now sought is small and the return will be large.

ENCLOSURE.

REPORT to accompany an estimate for a side channel to Pulleru at 30 miles $5\frac{1}{2}$ furlongs.

	RS.
Amount of estimate	1,290

To the left of Pulleru in the villages of Kondiparru, Rimmanapudy, Pasumarru and Penjendra there is a considerable area of land which can easily be commanded by a side channel from the main canal. Most of this land is under dry cultivation, but the extension of irrigation has rendered the lands to some extent liable to submergence and there is a universally expressed desire on the part of the ryots to convert them all into wet lands.

At present under two spouts from Pulleru 350 acres are now being irrigated, whilst if the side channel be made the area which can be cultivated will be 1,200 acres, distributed as follows :—

Village.	Present area cultivated.	New cultivation.	Total.
	ACS.	ACS.	ACS.
Kondiparru	90	160	250
Rimmanapudy	155	515	670
Pasumarru	105	155	260
Penjendra	...	20	20
Total ...	350	850	1,200

The present estimate therefore provides for a head sluice and side channel starting from 30 miles $5\frac{1}{2}$ furlongs. The head sluice is of the ordinary culvert type with a front retaining wall going down to a level one foot below the bed of the main canal. The side channel runs 50 feet in rear

of the present outer toe of the banks of Pulleru as that width of land has been taken up and reserved for the deposition of silt from the canal Exactly opposite the head sluice the existing Rimmanapudy branch will take off and as shown in the plan the point of bifurcation will be just at the angle of the main channel where it turns to become parallel to Pulleru. To preserve the relative dimensions of the two branches a rough stone revetment has been allowed. The side channel has a bottom width of 5 feet throughout, a bed and surface fall of one foot per mile and a depth of two feet with side slopes of 1½ to 1.

(Signed) A. CHATTERTON,
Ex. Engr., Gudiváda Division.

23rd October 1893.

No. 127 I.

Submitted to Government.

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Chief Engineer for Irrigation.

29th Oct. 1894.

ORDER—dated 2nd November 1894, No. 834 I., Public Works.

The following estimate is sanctioned from the balance of the amount reserved for unforeseen works of the Kistna delta system, which will then be reduced to Rupees 1,04,990:—

Capital Expenditure not charged to Revenue.
49. Irrigation.
Kistna Delta System.
Eastern Section.
I. Works.
Pulleru Canal.
3. Distributaries.
Excavating side channel at 30 miles 5½ furlongs.

		RS.	RS.
2. Land	... 1. Compensation	220	220
3. Works	... 2. Constructing sluice	650	650
4. Earthwork	... 3. Excavation	410	410
5. Miscellaneous	... 4. Demarcation stones	10	10
	Total estimate ...		1,290

2. This sanction is registered as No. 101 I. of 1894–95.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, II Circle, with estimate.
" Examiner, Public Works Accounts.
" Revenue Department.

IRRIGATION.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated November, 2nd.

Recd. *Encl.*

G.O., 2nd Nov. 1894, No. 834 I.

NOVEMBER.

Pulleru Canal

Estimate of Rs. 1,290 for excavating side channel, &c., to the —, Kistna delta system, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

Read—the following paper :—

From A. S. RUSSELL, Esq., Executive Engineer, Buckingham Canal Division, to the Superintending Engineer, II Circle, dated 14th October 1894, No. 1687.

I have the honour to submit for sanction a deviation statement in duplicate for diversion to canal from Chintamoni backwater to Pulicat lake amounting to Rupees 41,100.

2. The original estimate for this work, amounting to Rs. 42,600, was sanctioned in G.O., No. 389 I., dated 2nd May 1891.

3. The necessity for the deviations is explained in the remark column.

4. The saving of Rs. 1,500 effected by the deviations can be added to reserve at the disposal of Government.

No. 263 B.C.

Forwarded to the Chief Engineer for Irrigation for favour of obtaining the sanction of Government for the deviation proposed in the work "Diversion from Chintamoni backwater to Pulicat." The saving of Rs. 1,500 may be added to the balance available for unforeseen works.

(Signed) W. L. C. BADDELEY, Major, R.E.,
Suptg. Engineer, II Circle.

25th October 1894.

Order—dated 3rd November 1894, No. 835 I., Public Works.

The deviation statement, amounting to Rs. 41,100, for the diversion of the Buckingham canal from Chintamoni backwater to the Pulicat lake, is sanctioned in lieu of the estimate of Rs. 42,600 sanctioned for the work in G.O., No. 389 I., dated 2nd May 1891, the saving of Rs. 1,500 effected by the deviation statement being added to the amount available for unforeseen works of the canal, which will then be increased to Rs. 1,37,245.

2. This sanction is registered as No. 102 I. of 1894–95.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, II Circle, with deviation statement.
" Examiner, Public Works Accounts, with duplicate copy of deviation statement.
" Revenue Department.

IRRIGATION.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated November, 3rd.

Recd. *Encl.*

G.O., 3rd Nov. 1894, No. 835 I.

NOVEMBER.

Buckingham Canal

The deviation statement amounting to Rs. 41,100 for the diversion of the — from Chintamoni backwater to the Pulicat lake, sanctioned with remarks.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following paper:—

Statement of Minor Works, Revenue Department, requiring funds for expenditure by Public Works Department during the year 1894–95.

Executive division.	Name of work.	Amount required.	Remarks.
		RS.	
Cuddapah ..	Repairing Appayaraju kalva of Tallapaka, Pullampet taluk.	2,000	
	Repairing Ananthayyagaripalli channel do. ..	1,270	
	Repairing Payeru anicut and channel of Kottur, Sidhout taluk.	3,500	
	Restoration of Repalli tank, Jammalamadugu taluk.	1,050	Included as per Chief Engineer for Irrigation memo. No. III/40 C.D., dated 15th August 1894.
	Repairing the Surapparajucheruvu of Gudarcumpalli, Vayalpad taluk.	1,100	
Kurnool ..	Completing the repairs to the Bandimadugula tank.	370	
	Repairing the Birovol tank	700	
	Completing the repairs of Gopavevane tank ..	685	Charged against the ordinary grant as against Tank Restoration Scheme.
Bellary ..	Repairing the bund of Vupparagatta, Kudligi taluk.	248	Application for further funds will be made later on as estimates in hand with the Executive Engineer, Bellary division, are sanctioned.

No. 1807.

Forwarded to the Chief Engineer for Irrigation with reference to G.O., No. 504 I., dated 3rd July 1894.

BELLARY,
26th October 1894.

(Signed) C. C. RAWSON, Lieut.-Col., R.E.,
Superintending Engineer, III Circle.

ORDER—dated 3rd November 1894, No. 836 I., Public Works.

The following transfers of funds are sanctioned :—

Irrigation.
43. Minor Works and Navigation.
Minor Works, Revenue Department.

From	RS.	*To*	RS.	RS.
Reserve—		Repairs—		
Original works	10,923	Bellary division	248	
Establishment	2,512	Cuddapah	8,920	
Tools and plant	164	Kurnool	1,755	
				10,923
		Establishment		2,512
		Tools and plant		164
Total ...	13,599	Total ...		13,599

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
„ Superintending Engineer, III Circle.
„ Examiner, Public Works Accounts.
„ Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated November, 3rd.

Recd. *Encl.*

G.O., 3rd Nov. 1894, No. 836 I.

NOVEMBER.

Funds

Certain transfers of — in the III Circle, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

READ—the following paper :—

From W. C. LEWIS, Esq., Executive Engineer, Coimbatore Division, to the Superintending Engineer, IV Circle, dated Ootacamund, 17th October 1894, No. 4242.

With reference to your remarks No. 598 C.I., dated the 10th instant, on the return of sanctioned estimates for the month of September 1894, I have the honour to inform you that the contribution work of supplying and fixing a cast iron pipe sluice in the bank of Areapuram channel No. 73 was carried out as authorized in your No. 201 C.I. of 27th April 1894.

2. The full contribution of Rs. 25 as per the accompanying estimate was recovered from the party and the work has been completed already. I therefore request you to obtain the sanction of Government for the estimate of Rs. 25 herewith submitted.

No. 238 E.I.

Copy forwarded to the Chief Engineer for Irrigation with a request that he will be good enough to obtain the sanction of Government to the estimate of Rs. 25 in question with reference to paragraph 78, chapter IX, volume I of the Public Works Code.

2. The work has been carried out by this department to ensure the pipe being properly laid so as not to be a source of danger to the bank.

(Signed) J. HANNAN,
Suptg. Engineer, IV Circle.

25th October 1894.

ORDER—dated 3rd November 1894, No. 837 I., Public Works.

The execution by the Public Works Department of the work referred to is approved. The attention of the Superintending Engineer, IV Circle, is drawn to G.O., No. 718 I., dated 2nd October 1894.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
„ Superintending Engineer, IV Circle, with estimate.
„ Examiner, Public Works Accounts.
„ Revenue Department.

IRRIGATION.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated November, 3rd.

Recd. *Encl.*

G.O., 3rd Nov. 1894, No. 837 L

NOVEMBER.

Cast iron pipe sluice

The execution by the Public Works Department of the contribution work of fixing a — in the bank of Areapuram channel, Coimbatore division, approved with remark.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

READ—the following paper :—

From N. F. MACKENZIE, Esq., Under Secretary to the Government of India, Public Works Department (Civil Works—Irrigation), to the Secretary to the Government of Madras, Public Works Department, dated Simla, the 22nd October 1894, No. 216 I.

I am directed to acknowledge the receipt of the Proceedings of the Madras Government, No. 663 I., dated 12th September 1894, forwarded under No. 664 I. of the same date, requesting the approval of the Government of India to the classification of the revised estimate for extending Nundyar channel under " Minor Works for which neither Capital nor Revenue Accounts are kept."

2. With reference thereto, I am to say that, before passing orders on the proposal, the Government of India desire to be furnished with particulars regarding the estimated revenue and working expenses of the scheme.

ORDER—dated 5th November 1894, No. 838 I., Public Works.

From the Executive Engineer's report printed in Proceedings of the Madras Government, No. 245 I., dated 13th March 1891, it is observed that the revenue anticipated to be derived by the extension of the Nandyar channel is Rs. 5,400 on 1,800 acres at Rs. 3 an acre, which latter represents the difference between the wet and dry assessment. The working expenses at 8 annas an acre will be Rs. 900, leaving a net revenue of Rs. 4,500 or 8·3 per cent. or Rs. 54,000, the total of the revised estimate for the channel including establishment and tools and plant charges as shown in the margin.

	RS.
Works	42,500
Establishment	9,775
Tools and plant	637
Indirect charges	1,088
Total ...	54,000

2. Ordered that a copy of these Proceedings be forwarded to the Government of India for information.

[Here enter No. 839 I., dated 5th November 1894.]

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, VI Circle.
" Examiner, Public Works Accounts.
" Revenue Department.

ENDORSEMENT—dated 5th November 1894, No. 839 I., Public Works.

Forwarded.

(By Order.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

IRRIGATION.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated November, 5th.

Recd. *Encl.*

G.O., 5th Nov. 1894, Nos. 838, 839 I.

NOVEMBER.

Nundyar Channel, Trichinopoly Division

Forwarding copy of Proceedings detailing the estimated revenue and working expenses on the extension of the —.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following paper :—

From S. D. PEARS, Esq., Superintendent of Works, No. I Periyár Division, to the Chief Engineer, Public Works Department, dated Periyár, 27th October 1894, No. 148 C.E.

I have the honour to forward, for your approval and sanction, an estimate, amounting to Rs. 290, for purchasing 500 iron chatties and to state that their local purchase has been sanctioned in G.O., No. 2162 W., dated 1st September 1894.

ORDER—dated 6th November 1894, No. 840 I., Public Works.

The following estimate is sanctioned from the balance of the lump sum provision for tools and plant required for the Periyár Project, which will then be reduced to Rs. 63,057 :—

Capital Expenditure not charged to Revenue.
49. Irrigation.
Periyár Project.
III. Tools and Plant.
3. Tools.

	RS.
Purchasing 500 iron chatties, estimate	290

2. This sanction is registered as No. 103 I. of 1894–95.

(True Extract.)

(Signed) J. PENNYCUICK, Colonel, R.E.,
Secretary to Govt., P.W.D.

To the Chief Engineer for Irrigation.
„ Superintendent of Works, No. I Periyár Division, with one enclosure.
„ Examiner, Public Works Accounts.
„ Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated November, 6th.

Recd. *Encl.*

G.O., 6th Nov. 1894, No. 840 I.

NOVEMBER.

Iron Chatties

Estimate of Rs. 290 for purchasing 500 — required for use in No. I Periyár division, sanctioned.

Accompaniment to G.O., No. 841 *I., dated 6th November* 1894.

SECOND APPLICATION for additions and modifications of allotments for irrigation works for 1894–95, I Circle.

Division.	Item No.	Main and sub heads.	Names of works.	Existing grant.	Modification of allotments applied for. Reduction.	Modification of allotments applied for. Increase.	Modification of allotments proposed. Reduction.	Modification of allotments proposed. Increase.	Remarks.
			CAPITAL EXPENDITURE NOT CHARGED TO REVENUE.	RS.	RS.	RS.	RS	RS.	
			Gódávari Delta System.						
			Eastern Section.						
			Open Capital Account.						
		(3) Distributaries—	Kovur-Manjair Junction Canal.						
Gódávari Eastern..	1	3. Works ..	Constructing a culvert across Salapaka channel ..	..	..	270	..	270	Sanctioned in G.O., No. 344 I., dated 23rd April 1894.
		4. Earthwork ..	Extending Salapaka channel	..	..	1,030	..	1,030	An expenditure of Rs. 144 has been incurred by the Executive Engineer on the work and it has been stopped for want of funds.
						1,300		1,300	
			42. MAJOR WORKS (WORKING EXPENSES).						
Do. Western..	2	I. Extensions and Improvements, Minor.	Lump sum	18,000	5,000	..	5,000	..	Reduction proposed by the Executive Engineer to provide funds for item No. 3.
Do. ..	3	Tools and Plant.	Do.	5,000	..	5,000	..	5,000	The additional grant is required to provide funds for ballaouts. The increase may be met from item No. 2.
			43. MINOR WORKS AND NAVIGATION FOR WHICH NEITHER CAPITAL NOR REVENUE ACCOUNTS ARE KEPT, P.W.D.						
			Tank Restoration Works.						
Do. ..	4	Minor Original Works.	Lump sum	1,000	200	..	200	..	The Executive Engineer reports that only so much as is actually required for balance of estimates and for remaining two sanctioned estimates to be put in hand for execution have been allowed to stand and the balances surrendered as there are no sanctioned estimates.
	5	Repairs ..	Do.	3,000	2,100	..	2,100	..	
			43. MINOR WORKS AND NAVIGATION.						
			Work for which Capital and Revenue Accounts are kept, P. W. D.						
Ganjám ..	6	Revenue ..	Chilka lake canal	244	..	280	..	280	The Executive Engineer states that the amount is required to complete the work "Repairs to the banks and inlets of the Chilka lake canal."
			AGRICULTURAL WORKS.						
Do. ..	7	River Embankments, Repairs.	Lump sum	2,000	..	725	..	725	The Executive Engineer reports that the additional grant is required to complete certain sanctioned works under "River Embankments, Repairs."
Rushikulya ..	8	River Embankments, Minor Original Works.	Do.	1,000	500	..	500	..	The Executive Engineer reports that all labour between Russellkonda and Gulleri is diverted to the Gulleri channel. If easy work such as river banks is taken up the coolies will not go to the former. Hence the reduction proposed.
Do. ..	9	River Embankments, Repairs.	Do.	3,000	1,500	..	1,500	..	

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following paper :—

From A. H. GARRETT, Esq., Superintending Engineer, I Circle, to the Chief Engineer for Irrigation, dated Russellkonda, 18th Oct. 1894, No. 476 G.L.

I have the honour to submit herewith for your approval and sanction of Government second application of modification of irrigation allotments of this circle for 1894-95.

ORDER—dated 6th November 1894, No. 841 I., Public Works.

There are no funds available to meet the demand for item 1.

2. The following transfers of funds are sanctioned :—

Irrigation.
42. Major Works (Working Expenses.)
Gódávari Delta System.
Gódávari Western Division.

From	RS.	*To*	RS.
Extensions and Improvements ...	4,065	Tools and Plant	5,000
Establishment	935		
Total ...	5,000	Total ...	5,000

Irrigation.
43. Minor Works and Navigation.

From Minor Works for which neither Capital nor Revenue Accounts are kept, P.W.D. Tank Restoration Works. Gódávari Western Division.	RS.	RS.	*To* Ganjám Division. Minor Works for which Capital and Revenue Accounts are kept. Chilka Lake Canal. Revenue Account.	RS.	RS.
Minor Original Works ...	200		Maintenance and Repairs ...	280	
Repairs	2,100		Establishment	64	
					344
	2,300		Agricultural Works. River Embankment.		
Establishment	529				
Tools and Plant	35		Repairs	725	
		2,864			725

From Agricultural Works. Rushikulya Division. River Embankment.	RS.	RS.
Minor Original Works ...	500	
Repairs	1,500	
	2,000	
Establishment	293	
Tools and Plant	19	
		2,312
Total ...		5,176

To Minor Works for which neither Capital nor Revenue Accounts are kept, P.W.D. Ordinary Works.	RS.	RS.
Reserve—		
Minor Original Works ...	3,299	
Establishment	759	
Tools and Plant	49	
		4,107
Total ...		5,176

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
„ Superintending Engineer, I Circle.
„ Examiner, Public Works Accounts.

IRRIGATION.
ACCOUNT.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated November, 6th.

Recd. *Encl.*

G.O., 6th Nov. 1894, No. 841 I.

NOVEMBER.

Funds

Orders on application for modification of irrigation allotments for 1894–95, I Circle.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

Read—the following papers :—

No. 121 C.E.

Progress Report for August 1894.

General.—The inflow of labour to the works continued steadily through August; and at the end of the month the population of the Periyár camp had reached 3,600, an unusually high figure for the time of year. With the exception of the rather unfortunate contretemps on the main dam described below, the month was free from accidents of more than trifling importance and progress was satisfactory.

Rainfall.—At Periyár 10·85 inches, at Thekady 7·97, against averages of 8·41 and 5·83 inches, respectively, for the preceding five years. At Periyár rain fell on every day of the month, but not in sufficient quantity to stop work except for 1½ out of the 27 week-days of the month.

Health.—The mortality was rather higher than in July, though still not excessive, but the sickness showed on the whole an improvement. The hospital statistics are as follows. Considerably more than half the total sickness was as usual due to fever; of other ailments the majority were of a pulmonary nature :—

Camp.	Average population.	Daily average attendance.	Total treated.	Ratio sick to 1,000 of population.	Deaths.	Ratio death to 1,000 of population.
Periyár	3,319	132·67	1,492	449·53	11	3·31

Main dam.—The quantity of work done was as follows :—

	C. FEET.
Concrete	111,007
Rubble	49,525
Total ...	160,532

The present average level of the surface of the dam is 75 feet above datum, and the state of the work is illustrated by the accompanying sections. The only operations of special interest during the month were the closing of the vents (sills at 48 and 54 above datum) through which the lake surplus has been passing during the last 9 months and the turning of the surplus through the tunnel instead (sill level 61). These operations were rendered very much more difficult by the incessant rain and the consequently heavy discharge of the river. For closing the 48 vent a day was chosen when the lake level was 58. There was therefore a depth of 4 feet running through the 54 vent, giving a discharge just sufficient to supply the workshop turbine. Shutters were dropped into the vent and caulked from behind, a pulsometer then easily kept down the leakage and the vent was blocked with rubble masonry 20 feet thick, of which 8 feet in Portland cement. After sufficient time had elapsed for the

cement to set, the pulsometer was removed and the water allowed to rise against the blocking which was found to be perfectly water tight. The same process was repeated in raising the surplus from the 54 vent to the tunnel. With the lake level at 65·40 shutters were dropped into the 54 vent and the turbine supplied through the tunnel. The shutters were caulked and a pulsometer again easily dealt with the small amount of leakage. The blocking had not been completed however, when at midnight the pump suddenly failed, owing (as it was afterwards found) to the blowing out of a small piece of packing under one of the lowest shutters; the water immediately rose against the blocking (the uppermost part of which was then only 4 feet thick and had been put in but 6 hours previously) with the result that the new masonry showed 2 or 3 leaks, so considerable that it would have been impossible, even had it been desirable, to stifle them by proceeding with the back portion of the blocking. It was therefore necessary to remove the blocking and, by re-opening the 54 vent, to lower the lake level which had meanwhile risen to + 70. When the month closed the removal of the leaky masonry was still in progress. The mishap was not one of great importance and with a slowly rising lake in the finer weather of September is not likely to recur when a second attempt is made. Its result will merely be to delay the blocking of the vent by 3 or 4 weeks, and consequently the filling in of the passage behind it with concrete to the same level as the concrete on the two flanks of the dam. Towards the end of the month the new wire ropes arrived from England for the ghât and the workshop wire ropeways. The want of the former especially was becoming urgent to replenish the stock of limestone at Periyár which was rapidly becoming depleted by the heavy demand due to the progress of work on the main dam. Other stocks of lime, surki, firewood, and charcoal in particular, were also heavily drawn upon. This is always inevitable in the south-west monsoon months and the usual break between the monsoons must be depended upon for the replenishment of stocks of these materials.

Left Bank Escape.—The excavation of foundations was proceeded with. The excavation will in the ordinary course be completed about the end of November, but can without difficulty be pushed to completion in a few weeks should unexpectedly rapid progress on the main dam render this advisable.

Water-shed tunnel.—The progress made in the month was 122 feet from the north end face only, leaving 184 feet to be bored. The progress, although above the average, would have been still greater but that the drills were stopped and the foul air blown out on two days on which observations of the underground line were taken with a view to ensure an accurate meeting next month. At the foot of No. 1 shaft fair progress was made in blasting out the chamber for the reception of the regulating sluices.

Miscellaneous.—As already mentioned the absence of a wire rope prevented any traffic in limestone by the ghât ropeway and in consequence there was no navigation by the canal. The Thekady-Periyár road is being allowed to fall into disrepair as it will in a few months be entirely superseded by water-carriage; it was accordingly maintained in a merely passable condition. At two points it was submerged during August for the first time and traffic was carried by a ferry and diversion.

PERIYAR,
8th September 1894.

(Signed) S. D. PEARS,
Supt. of Works, No. I Periyár Divn.

To the Chief Engineer, Public Works Department.

Note by the Chief Engineer, Public Works Department.

Submitted for the information of Government.

The submission of this report has been delayed owing to my absence on tour, and as the report for September, during which month I inspected the works, will be received in a few days it will be convenient to defer any general remarks until the submission of that report.

It will be observed that the improvement in the rate of progress on the main dam continues. The quantity of 160,532 cubic feet greatly exceeds that done in the corresponding month of any previous year.

I may add that I have heard from the Superintendent of Works that the closing of the 54 vent was satisfactorily completed on the 30th September and that the tunnel faces met "very accurately" on the 4th instant.

(Signed) J. PENNYCUICK, Colonel, R.E.,
Chief Engineer, P.W.D.

12th October 1894.

ORDER—dated 6th November 1894, No. 842 I., Public Works.

Recorded and communicated to the Government of India.

2. The Chief Engineer's remarks on the report for September will be awaited.

[Here enter No. 843 I., dated 6th November 1894.]

(True Extract.)

(Signed) J. PENNYCUICK, Colonel, R.E.,
Secretary to Govt., P.W.D.

To the Superintendent of Works, No. I Periyár Division.
" Chief Engineer for Irrigation.
" Revenue Department.

ENDORSEMENT—dated 6th November 1894, No. 843 I., Public Works.

Forwarded.

(By Order.)

(Signed) J. PENNYCUICK, Colonel, R.E.,
Secretary to Govt., P.W.D.

IRRIGATION.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated November, 6th.

Recd. *Encl.*

G.O., 6th Nov. 1894, Nos. 842, 843 I.

NOVEMBER.

Periyar Project

Forwarding Proceedings recording the progress report of works on the — in No. I division for August 1894.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

READ—the following papers :—

No. 140 C.E.

Progress Report for September 1894.

General.—The month opened with an outbreak of cholera which seemed likely to be serious inasmuch as the villages from which the majority of the labour is drawn were, many of them, full of the disease. The infected families were at once isolated however, and though two members of the families in question were attacked after isolation, the disease did not spread to other houses and for the remainder of the month the camp was free of it. Labour was plentiful throughout the month. The weather was also on the whole propitious for the time of year. The works were inspected by the Chief Engineer during the month.

Rainfall.—At Periyár 4·69 inches were registered during the month against an average of 5·69 inches for the previous five years: at Thekady 2·30 inches against an average of 5·64 inches.

Health.—The subjoined hospital statistics show an improvement, as compared with the preceding month, both in sickness and mortality. There was, however, a more than usual amount of fever among the officers and upper subordinates. The smell of the lake became very offensive towards the end of the month, being often distinctly perceptible 300 yards from the water, and in the officers' quarters it was frequently necessary to live with closed doors and windows. There were several rather serious accidents during the month—one to a boy whose hand was so injured by the ghât ropeway machinery as to necessitate amputation; one to a man by the explosion of a cartridge of which he was in illicit possession, which also involved amputation; one to a woman whose arm was broken by a blow from a stone during blasting; and one to a man who fell 25 feet from the main road quarry. None of these ended fatally however :—

Camp.	Average population.	Daily average attendance.	Total treated.	Ratio sick to 1,000 of population.	Deaths.	Ratio death to 1,000 of population.
Periyár	3,644	116·23	1,380	378·70	5	1·37

Main Dam.—The quantity of work done was not quite up to expectations, being as follows :—

	C. FEET.
Concrete	99,239
Rubble	49,477
Total ...	148,716

against a total of 160,532 cubic feet for August. The slight falling off was due entirely to shortness of materials, surki in particular. This material is always a difficulty at this time of the year, as it is impossible to manufacture it during the rains of the south-west monsoon, and the work done in July, August and September has in consequence to be supplied entirely from such stock as can be accumulated during the preceding recess. The stock at the beginning of the present season was larger than usual, but the demand in July and August was also larger than usual with the result mentioned. The supply of materials was also somewhat complicated by the fact that at the end of August for the first time the lake reached such a level as to submerge the road; cart traffic had to be replaced at a few hours' notice by water traffic, and though the contingency had been foreseen and provided for as far as possible, some disturbance in the regularity of supply was inevitable. The operation of closing the vent through the main dam which had been unsuccessfully attempted in August as described in the last report was again attempted in September and this time, under more favorable conditions of lake and weather, with success. The lake surplus water now passes through the tunnel only and will so continue until the time arrives to pass the water through the water-shed tunnel to Madura district, when the tunnel in the main dam will be finally closed. The condition of the work at the close of the month is illustrated by the accompanying sections and photographs (will follow).

Left Bank Escape.—The excavation of foundations was continued. The lie of the bed rock is not so favorable as it at first promised to be, but there is no reason to apprehend any serious fault or other difficulty.

Water-shed Tunnel.—An advance of 33 feet was made in the first week of the month, leaving 140′ to be bored to a meeting. It was then decided to effect the meeting by means of a heading of the full height of the tunnel and 8′ in width, the object being that, should there be any inaccuracy in the alignment of the two sections of the tunnel, their meeting could thus be trimmed off to an easy curve, if necessary; 115′ of the heading was taken out up to the end of the month, and it may be added that on the night of the 4th October the meeting was accurately effected. It now only remains therefore to blow off the sides of the heading to full section in order to complete the tunnel.

At the south end of the tunnel the preparation of the rock to receive the masonry work of the regulating sluices was proceeded with.

Miscellaneous.—The new rope was spliced on to the ghât wire ropeway on the 3rd September, and traffic regularly carried on the ropeway as well as on the canal for the rest of the month.

Periyar, (Signed) S. D. PEARS,
9th October 1894. Supt. of Works, No. I Periyár Divn.

To the Chief Engineer, Public Works Department.

Note by the Chief Engineer, Public Works Department.

Submitted for the information of Government.

The progress on the main dam, though rather less than in August for the reasons explained in the report, was considerably greater than in the corresponding month of any previous year, and a still greater improvement will, it is hoped, take place during the current month when the weather will be better and the means of transport more efficient.

The 54 vent, the closing of which gave a considerable amount of trouble, has now been satisfactorily dealt with, and it is evident from the sections that no time has been lost in beginning the masonry in its rear; by the end of the present month this portion will, it is hoped, be brought up nearly if not quite to the same level as the remainder of the dam. It would have been as well if the Superintendent of Works had given a brief account of the measures adopted for closing this vent.

The ground to be occupied by the left bank escape was still too much water-logged during my visit to enable a proper examination to be made, but from what I saw I am inclined to think that it will give more trouble than Mr. Pears expects, and it may be necessary to substitute an earthen bank for a masonry wall. The matter is not of much consequence one way or another; for many reasons I should prefer a masonry wall, but it is not worth while to go to any great expense in order to find a foundation for it.

It is stated that the meeting of the tunnel faces was "accurately effected;" in the next report it should be stated what was the exact amount of error, both horizontal and vertical, and also how the length compares with that estimated from the omnimeter survey by which the line was laid out; the information will be of use as a test of the accuracy of work with the omnimeter; of its convenience and rapidity there can be no doubt.

(Signed) J. PENNYCUICK, Colonel, R.E.,
Chief Engineer, P.W.D.

16th October 1894.

Order—dated 6th November 1894, No. 844 I., Public Works.

Recorded and forwarded to the Government of India.

[Here enter No. 845 I., dated 6th November 1894.]

(True Extract.)

(Signed) J. PENNYCUICK, Colonel, R.E.,
Secretary to Govt., P.W.D.

To the Superintendent of Works, No. I Periyár Division.
" Chief Engineer for Irrigation.
" Revenue Department.

Endorsement—dated 6th November 1894, No. 845 I., Public Works.

Forwarded.

(By Order.)

(Signed) J. PENNYCUICK, Colonel, R.E.,
Secretary to Govt., P.W.D.

IRRIGATION.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated November, 6th.

Recd. *Encl.*

G.O., 6th Nov. 1894, Nos. 844, 845 I.

NOVEMBER.

Periyar Project

Forwarding Proceedings recording the progress report of works on the — in No. I division for September 1894.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

READ—the following paper :—

From N. F. MACKENZIE, Esq., Under Secretary to the Government of India, Public Works Department (Civil Works—Irrigation), to the Secretary to the Government of Madras, Public Works Department, dated Simla, 13th September 1894, No. 167 I.

With reference to your endorsement No. 14 I., dated the 10th January 1894, I am directed to forward herewith a copy of the undernoted despatch from Her Majesty's Secretary of State for India sanctioning the re-revised estimate amounting to Rs. 47,56,000 of the cost of constructing the Rushikulya irrigation project in Madras, together with a copy of the Government of India despatch replied to.

	RS.
Direct charges	43,68,000
Indirect charges	3,88,000
Total ...	47,56,000

2. I am to invite the special attention of the Government of Madras to the remarks made by the Secretary of State in paragraph 4 of his despatch above quoted.

3. The sanction referred to in paragraph 1 above has been registered in this office as No. 7 I. of 1894–95 and is in supersession of all previous sanctions which are hereby cancelled.

ENCLOSURES.

Despatch from the Government of India, Public Works Department (Civil Works—Irrigation), to the Right Honorable the Secretary of State for India, dated Simla, the 22nd May 1894, No. 27, Public Works.

We have the honour to submit, for your approval and sanction, a second revised estimate amounting to Rs. 47,56,000, of which Rs. 43,68,000 represent the direct and Rs 3,88,000 the indirect charges for the Rushikulya project, a protective irrigation work in the Ganjám district of the Madras Presidency.

2. The original estimate for this project amounting to Rs. 28,60,239, inclusive of direct and indirect charges, was sanctioned in Lord Kimberley's despatch No. 25, Public Works, dated the 26th April 1883, and the sanction of the Secretary of State to the first revised estimate for the project amounting to Rs. 43,16,000, inclusive of direct and indirect charges, was applied for in our Public Works despatch No. 2, dated the 7th January 1891, and communicated in Viscount Cross' despatch No. 18, Public Works, of the 12th March 1891. The amounts of the first and second revised estimates are compared below :—

	First revised estimate.	Second revised estimate.	Difference, more.
	RS.	RS.	RS.
Direct charges	39,40,000	43,68,000	4,28,000
Indirect charges	3,76,000	3,88,000	12,000
Total ...	43,16,000	47,56,000	4,40,000

The excess over the first revised estimate sanctioned by the Secretary of State in March 1891 thus amounts to Rs. 4,40,000, or about 10·20 per cent.

3. From the note by the Chief Engineer for Irrigation, No. 215 I., dated 23rd December 1893, included in the papers printed in the Proceedings of the Government of Madras, No. 13 I., dated the 10th January 1894, which form an enclosure to this despatch, it will be seen that since the submission of the first revised estimate it has been found that the sanctioned rates for work still to be done were insufficient, while, as the works advanced, several new works were found to be required, necessitating the submission of a second revised estimate. This second revised estimate appears to have been thoroughly considered by the Madras authorities and it is accepted by us. The whole of the net excess is practically under the head of "Earthwork" and is due more to insufficient rates allowed in the first revised estimate than to insufficient quantities. The rates now entered are based on the rates of work actually executed and are considered by us to be sufficient and reasonable for the class of work to be executed.

4. The forecast statements attached to the second revised estimate show that the project will be completed during 1899–1900, that the ultimate area of irrigation is estimated to be 117,250 acres, and that at the end of the tenth year after completion of the work there will be a balance of charges over revenue amounting to Rs. 8,13,829, which, added to Rs. 47,56,000, the total of the direct and indirect charges, will make the sum at charge of the project to be Rs. 55,69,829. At that period the project will yield a net revenue of Rs. 1,88,085, which is equivalent to 3·38 per cent. on the sum at charge.

From paragraph 20 of the note by the Chief Engineer for Irrigation, it will be seen that the water rate to be levied, viz., Rs. 1·9 per acre, is lower than that prescribed for other districts, and we consider that this rate should be capable of increase later on, and we therefore accept the forecast statements as submitted by the Government of Madras.

5. Of the amount of the second revised estimate, viz., Rs. 47,56,000, Rs. 32,45,259 were spent up to the end of 1892–93 and Rs. 15,10,741 remained to be spent subsequent to the 31st March 1893. The work in connection with the project is therefore far advanced, as more than two-thirds of the total estimated cost have already been spent, and we would invite your attention to paragraph 10 of our despatch No. 2, Public Works, dated the 7th January 1891, with regard to the protective advantages of this project, to the second revised estimate for which we now have the honour to solicit your sanction.

Despatch from the Right Honorable the Secretary of State for India, to His Excellency the Right Honorable the Governor-General of India in Council, dated India Office, London, 19th July 1894, No. 34, Public Works.

Revised estimate of cost of the Rushikulya irrigation project in Madras.

I have received your Excellency's Public Works letter, No. 27, dated the 22nd May 1894, submitting for my sanction a revised estimate, amounting to Rs. 47,56,000, for the Rushikulya project, a protective irrigation work in the Ganjám district of the Madras Presidency.

2. A previous revised estimate for this work amounting to Rs. 43,16,000, showing an increase of more than 50 per cent. over the original estimate, was submitted with the letter from the Government of India, No. 2, dated the 7th January 1891, and, in according his sanction thereto, my predecessor expressed his regret that the serious miscalculations made in the original estimate should have rendered it necessary to sanction such a large addition to the capital cost of the scheme.

3 The further increase now proposed in the estimate is due in a large measure to the insufficient rates allowed in the last revised estimate submitted.

4. So far as can be judged from the Proceedings of the Madras Government in the Public Works Department which are appended to your letter, the rates appear to have been carelessly calculated, for no explanation is offered of some palpable errors. From the previous correspondence, moreover, it appears that the original estimate for this project broke down because the rates entered were "utterly insufficient;" so that I find with surprise that the inadequacy of the first revised estimate is now again attributed to the same defect. I request that the Government of Madras may be invited to take measures for the better preparation, in future, of important and costly projects, since repeated mistakes of this kind are not creditable to the officers responsible for them and weaken the reliance that can be placed upon the data which are laid before me as the basis for decision in these cases.

5. The work is now far advanced to completion, and your Government are of opinion that the rates now adopted are sufficient and reasonable and in accordance with the experience actually gained of the work already executed. While regretting that it should be necessary to make a further addition to the estimated cost of the Rushikulya project, I am prepared, on the representations made in the letter from your predecessor's Government of 7th January 1891 as to the value of the scheme as a protective work, to sanction the additional outlay now proposed.

6. The net revenue which will be derived from the project at the end of the tenth year after completion of the work is estimated at Rs. 1,88,085, which is equivalent to a return of 3·38 per cent. on the sum at charge for interest.

7. I notice, however, that these figures are based on the assumption that the total area commanded by the works will be assessed for water-rate. This is evidently an assumption which would be warrantable in few, if any, cases, and should not be adopted as the basis of a forecast of irrigation revenue. But I infer from paragraph 4 of your Excellency's letter that you have accepted the forecast statement on the ground that the rate which it is proposed to levy is low and should be capable of increase later on.

Order—dated 7th November 1894, No. 846 I., Public Works.

Communicated to the officers concerned.

2. The attention of the Chief Engineer for Irrigation is drawn to the remarks made by the Secretary of State in paragraph 4 of his despatch.

3. This sanction is registered as No. 104 I. of 1894–95.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
,, Superintending Engineer, I Circle.
,, Examiner, Public Works Accounts.
,, Revenue Department.

IRRIGATION.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated November, 7th.

Recd. *Encl.*

G.O., 7th Nov. 1894, No. 846 I.

NOVEMBER.

Rushikulya Project

Sanction of the Secretary of State for India to the revised estimate of Rs. 47,56,000 for the —, communicated to the officers concerned with remarks.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Establishment.

READ—the following paper :—

From Major W. L. C. BADDELEY, R.E., Superintending Engineer, II Circle, to the Chief Engineer for Irrigation, dated Bezwada, 28th September 1894, No. 1462 K.S.

With reference to paragraph 2 of G.O. No. 420 I. of the 29th May 1894, I have the honour to bring to your notice that the following proposals were made to the Collector of Kistna for the appointment of Conservators for the Kistna river and fixing their jurisdictions :—

(*a*) Executive Engineer, Kistna Northern division, to be Conservator and have jurisdiction over the whole of the Kistna river above the anicut including the embankments on the right and left banks.

(*b*) Executive Engineer, Kistna Western division, to be Conservator and have jurisdiction over the whole of the Kistna river below the anicut and the embankment on the right bank.

(*c*) Executive Engineer, Kistna Eastern division, to be Conservator and have jurisdiction over the embankment on the left bank of the river below the anicut.

2. It is not proposed at present to frame any rules under section 22 of Madras Act VI of 1884.

3. The Collector of Kistna, in his letter No. 3199-Ver. of the 15th instant, informed me that " the proposals therein * contained are suitable and that I have no remarks to offer." I request, therefore, that the River Conservators may be appointed under section 6 and necessary orders issued for carrying out the provisions of the Act.

* My letter No. 570 K.S., dated 12th June 1894.

4. From my inspection of the river sets, I am convinced that liberal grants and systematic work are essential if we wish to preserve the Bank canal, Western delta; and if, as I hope it will be, the Bank canal, Eastern delta, is extended to the river opposite to the island of Divi, the same necessity exists for preserving the lunkas between the left flood bank and the river. In the Western delta some excellent work has been done and the object of placing the whole of the river below the anicut in charge of the Executive Engineer, Kistna Western division, is to avoid the possibility of the Conservators working against each other from want of knowledge as to what has been done on the other side.

5. On the return of Messrs. Malet and Smith, proposals will be framed regarding the establishment and boats required.

Order—dated 7th November 1894, No. 847 I., Public Works.

The following notification will be published in the Fort St. George and Kistna District Gazettes in three consecutive issues :—

His Excellency the Governor in Council is pleased to appoint, under section 6 of the River Conservancy Act (VI of 1884), the following officers as Conservators of Rivers within the limits of jurisdiction noted below :—

Executive Engineer, Kistna Northern division, to be Conservator over the whole of the Kistna river above the Bezwada anicut including the embankments on the right and left banks.

Executive Engineer, Kistna Western division, to be Conservator over the whole of the Kistna river below the Bezwada anicut and the embankments on the right bank.

Executive Engineer, Kistna Eastern division, to be Conservator over the embankment on the left bank of the Kistna river below the Bezwada anicut.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
,, Superintending Engineer, II Circle.
,, Examiner, Public Works Accounts.
,, Legislative Department.
,, Revenue Department.
,, Superintendent, Government Press.

Orders—dated 7th November 1894, No. 537 I., Public Works.

The following notification will be published in the Fort St. George and [illegible] District Gazettes of [illegible]:—

His Excellency the Governor in Council is pleased to [illegible] under section [illegible] of the [illegible] the following officers as [illegible] within the limits of jurisdiction noted below:—

Executive Engineer, [illegible] Division, to be Conservator over the whole of the [illegible] river above the [illegible] on the right and left banks.

Executive Engineer, [illegible] Division, to be Conservator over the whole of the [illegible] river below the [illegible] on the right bank.

Executive Engineer, [illegible] Division, to be Conservator over the embankment on the left bank of the [illegible] river below the [illegible].

(True Extract.)

(Signed) [illegible], Colonel, R.E.,
Joint Secy. to Govt., P. W. D.,
Irrigation Branch.

IRRIGATION.
ESTABLISHMENT.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated November, 7th.

Recd. *Encl.*

G.O., 7th Nov. 1894, No. 847 I.

NOVEMBER.

Conservators of the Kistna River

The appointment of the Executive Engineers, Kistna Northern, Western and Eastern divisions, as — within the limits of their jurisdiction, notified.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

Read—the following papers:—

From the Executive Engineer, Buckingham Canal, to the Superintending Engineer, II Circle, dated Madras, 6th June 1894, No. 660.

I have the honour to forward an estimate, amounting to Rs. 8,050, together with enclosures, for conversion of the Pálár north flood gate into a lock.

2. The construction of the lock was originally advocated in this office No. 176, dated 17th April 1893, paragraph 7, printed with G.O., No. 456 I., dated 18th May 1893, and was approved by the Chief Engineer for Irrigation—*vide* paragraph 12 of note printed with G.O., No. 791 I., dated 16th September 1893.

3. In conjunction with a lock to be hereafter built at Covelong south flood gate and improvements to canal between the two locks, the Pálár north lock will, as explained in this office No. 622, dated 4th instant, make the south canal, as far as the Pálár river, thoroughly efficient.

4. The amount of the estimate can be met from the reserve at the disposal of Government.

No. 120 B.C.

Forwarded to the Chief Engineer for Irrigation for favour of obtaining sanction of Government to the estimate for converting Pálár north flood gate into a lock.

(Signed) W. L. C. BADDELEY, Major, R.E.,
Suptg. Engineer, II Circle.

6th July 1894.

Enclosure.

Report to estimate for conversion of Pálár north flood gate, mile 45, south canal, into a tidal lock.

	RS.
Amount of estimate	8,050

Necessity for lock at Pálár North flood gate.—The Pálár north flood gate is situated at mile 45, south canal. The bed level of the canal from Covelong, mile 23, to the Pálár north flood gate, 22 miles in all, is now so much higher than its original level that there is throughout barely 1½ feet of water at low tide, and it is only by dint of incessant clearances during the low tide season from December to May and careful attention to the sea bars that traffic can be kept up even for the small craft that use the south canal during this period of the year. The Pálár bar can always be kept open, and if the Pálár north flood gate is converted into a lock, tidal water can be impounded into the canal whenever required and the water level kept up to nearly high tide level, which will give throughout the year a depth of at least 3 feet of water, even during the season of lowest tides. A separate estimate is under preparation for converting

the present disused Covelong south flood gate into a lock and for improvements to the whole reach between this flood gate and the proposed lock at Pálár north flood gate. The execution of these works will make, in conjunction with the proposed lock at Pálár north flood gate, the whole reach of 22 miles thoroughly satisfactory and will obviate all trouble in future maintenance.

2. *Design and estimate of lock.*—The design and estimate for the lock have been made according to the suggestions made in letter No. 163, dated 19th April 1894, from Executive Engineer, Buckingham Canal, to the Superintending Engineer, II Circle, and memorandum thereon No. 23/B.C., dated 4th May 1894, by the Chief Engineer for Irrigation. The design is the most economical that is possible consistent with efficiency, and a comparison with other sanctioned designs and estimates for locks already carried out, or in course of execution, will show how considerable is the saving made.

3. *Differences between new and old designs.*—The main differences made in the new design are—

(*a*) Designing the lock merely as a work for impounding and retaining tidal water, and, without any reference to M.W.L. in canal, floods in canal being allowed to sweep right up to the flood gate and *over* the additional lock gates and new walls to be added in order to form the lock. These new gates and walls will only be carried up to 6″ above H.S.T. The economy effected by this plan is great, the lock will be equally effective as locks hitherto constructed, and it is not anticipated that any injury will be caused by canal water in times of flood being allowed to tap the lock gates and new walls, floods in canal rising and subsiding slowly. From paragraph 4 of this report, it will be seen that M.F.L. in canal will in future be kept down to a lower level than hitherto. Experience last year at the Kandaleru lock confirms this view.

(*b*) Omitting the revetted chamber and toe wall hitherto allowed for locks and substituting newly a turfed chamber with cheap wings, as shown in plan, designed so as to suit the alteration of slope from that existing to a slope of 3 to 1.

(*c*) Economies in foundations, experience having shown that these may safely be effected.

4. *Disposal of flood water in canal.*—The M.W.L. in canal is H.S.T. + 3·50′. The length of the reach to the next flood gate is only 3 miles, the Pudupatnam south flood gate being only that distance off. There exists at present a 10-vent masonry outlet to discharge the cross drainage. Further means of escape is desirable, as a considerable amount of drainage enters the canal, but no site exists for a cheap bywash, and as the reach is throughout in heavy cutting it is not worth while to go to any considerable expense in making further means of surplus. The floods in the Pudupatnam backwater are inconsiderable and the Pudupatnam south flood gate will naturally never be closed for long and will always be opened some time before the Pálár north flood gate, thus affording an effective means of escape for flood waters from canal and diverting the first rush of flood waters out of canal *away* from the new lock which is desirable. There is stated never to be any considerable difference between flood level in the Pudupatnam backwater, and in the canal itself and a proposal has therefore been made to remove the Pudupatnam flood gates. If the bar of the Pudupatnam backwater is prepared for cutting, immediately land floods occur,—a precaution that has hitherto not been taken,—the M.W.L. in canal can probably be kept down to 2 feet above H.S.T. and in any case to much less than it has hitherto been and the necessity thus avoided for providing additional means of surplus to discharge cross drainage entering canal between the new lock and the Pudupatnam backwater.

5. *Alterations and additions required to form a lock at Pálár North flood gate.*—The existing flood gate will be fitted with another pair of gates and new wings and side walls constructed 150 feet off, as shown in plan, so as to hold another pair of gates and thus to form a lock, the new gates being forced *towards* the canal in order to admit and retain tidal water. The details of design are as follows:—

(*a*) Lowering the sill of existing flood gates to allow the new lock gates to swing.

(*b*) Constructing in existing flood gate pillars of cement concrete well founded, as shown in plan, to act as abutments for the new lock gates, thus contracting width between quoins to 18 feet.

(*c*) Constructing pillars of cement concrete to act as fender pillars in order to protect gate from shocks of passing boats.

(*d*) Forming recesses, 7½ feet in height from floor, just sufficient to receive the valve shutters, and cutting groove to top of wall to receive rack.

(*e*) Constructing new wing and side walls to hold inner lock gates, the height of all new walls being only carried to 6″ above H.S.T.

6. *Lock gates.*—It is proposed to utilise the Pudupatnam south flood gates with alterations for the inner lock gates of the new lock. The Pudupatnam gates are already coppered, and a lump sum of Rs. 300 only is allowed in the estimate for altering and fitting them. Owing to the height of the existing Pálár north flood gate and contraction in width from 20 to 18 feet, an entirely new pair of gates will be necessary for the lock gates to be fixed in the masonry of the existing flood gate, but gearing, valve shutters, and balance beams can be made available from abandoned flood gates. The top of planking of the two pairs of new lock gates will only be carried up to H.S.T. + 6″, and the gates will be copper sheathed below ordinary low tide level.

7. *Sill level of lock gates* will be on the same level as that of the flood gate already built as shown on plan.

8. *Width of lock gates and length of chamber.*—A clear width between quoins of 20 feet and a length between sills of flood and lock gate of 150 feet are allowed as usual; but the width in the existing flood gate, where cement concrete pillars are to be built in order to hold the additional lock gates, is necessarily contracted to 18 feet as shown in plan.

9. *Chamber.*—The chamber will be simply a well-turfed slope of 3 to 1. The wings of the gate will be carried out, as shown in plan, in one footing to meet the end of slopes. This will be quite effective and also inexpensive.

10. *Site of lock.*—The canal and flood gate is already straight, and the lock will have a straight approach as shown in plan.

11 *Sub-soil and foundations of new walls.*—Borings have been taken and the sub-soil is found to be firm and compact sand. The foundations have accordingly been designed 4 feet in depth below sill level on a block of surki concrete. Such a type of foundation is ample, and there is no necessity for costly well foundations as allowed in designs of locks hitherto sanctioned.

12. *Temporary diversion channel.*—A temporary diversion channel to pass traffic during the construction of the lock is provided through the east bank of the existing canal. This line, though a long one, is found to be the cheapest and best available.

13. *Rates.*—The rates provided in the estimate are the same as those for which the Pálár north flood gate was actually built.

MADRAS,
6th June 1894.

(Signed) A. S. RUSSELL,
Ex. Eng., Buckingham Canal.

MEMORANDUM.

No. II/30 B.C.

With reference to endorsement No. 120 B.C., dated 6th July 1894, from the Superintending Engineer, II Circle, submitting estimate for converting the Pálár north flood gate into a lock, the undersigned has the honour to say that there seems to be something wrong with the foundation of returns which appear from the cross section to be designed to rest on made-earth It is requested that information on this point may be submitted as the plan is not very clear.

(Signed) F. W. ASHPITEL,
Dy. Chief Engineer for Irrigation.

20th July 1894.

From Major W L. C. BADDELEY, R.E., Superintending Engineer, II Circle, to the Chief Engineer for Irrigation, dated Bezwada, 10th August 1894, No. 171 B.C.

[Converting Pálár north flood gate into a lock.]

With reference to your memo. No. II/30 B.C., dated 20th July 1894, I have the honour to report that only a small portion of the returns, hatched in black dots, on cross sections A.B. appears to be designed to rest on made-earth. These, however, have now been extended 6 feet into the slope of the canal bank, hatched in red dots. The cross section on A.B. of the canal has been made more clear by showing the foundations of returns, &c.

No. 111 I.

Submitted to Government. The amount of the estimate has been raised in this office from Rs. 8,050 to Rs. 8,230, the increase being due to a concrete flooring 2 feet thick being provided instead of 1 foot thick as proposed by the Superintending Engineer.

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Chief Engineer for Irrigation.

6th Oct. 1894.

Order—dated 7th November 1894, No. 848 I., Public Works.

The following estimate is sanctioned from the balance of the amount reserved for unforeseen works of the Buckingham Canal, which will then be reduced to Rs. 1,29,015 :—

Irrigation.
43. Minor Works and Navigation.
Minor Works for which Capital and Revenue Accounts are kept.
Buckingham Canal.
Capital Account.
I. Works.
2. Main Canals and Branches.
9. Navigation Works.

	RS.
Converting Pálár north flood gate into a lock, estimate	8,230

2. This sanction is registered as No. 104 I. of 1894-95.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
,, Superintending Engineer, II Circle,
with five enclosures.
,, Examiner, Public Works Accounts.
,, Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated November, 7th.

Recd. *Encl.*

G.O., 7th Nov. 1894, No. 848 I.

NOVEMBER.

Lock

Estimate of Rs. 8,230 for converting Pálár north flood gate, Buckingham Canal, into a —, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

READ—the following paper:—

From the Executive Engineer, Nellore Division, to the Superintending Engineer, II Circle, dated 25th June 1894.

I have the honour to forward herewith the estimates for the improvements to the Chennur tank revised in accordance with the instructions given in your No. 18 C., dated 10th May 1894, with the exception that the drop in rear of the breached portion of the eastern weir has not been provided.

2. The cost would be greater as a heavy side retaining wall would have to be built, and owing to the great fall into the cistern behind a strong flooring would have to be built, and the stones of this cannot be procured except with great delay and difficulty.

3. The cost of repairs could be diminished by over Rs. 700 by omitting the provision made in the estimates now submitted for new heads and screw gearing shutters to the two old sluices which stood.

4. I do not think we shall have the time to carry out this part of the estimate before the rains set in and as it is not urgent it could lie over till next year.

ENCLOSURE.

REPORT to accompany the plans and estimates for the Chennur tank improvements.

	RS.
Amount of estimate	8,140

The estimate provides for the repair of this tank which was completely wrecked in the floods of November 1893 when three of the upper tanks breached and the Venkatagiri river swept into the tank.

Bund.—There were 16 breaches; these have been closed. Good firm clay being obtainable, it was not necessary to provide for puddle walls to the deeper breaches as was first anticipated.

If necessary the new earth will be protected with darbai revetment; no stone revetment has been provided.

Sluices.—Two of the sluices were washed away. Provision has been made for restoring them and for screw geared shutters. The two sluices which were uninjured will also be fitted with screw gearing.

Weirs.—There are two existing weirs, one 100 feet long at the east end and another 66 feet long at the west end, both fitted with dam stones. The first weir which was a very substantial work was very badly damaged, one wing being washed away and the other badly cracked. This weir will be rebuilt in portions where restoration is necessary and repaired.

The western weir will remain as it is, and as additional means of escape are necessary a temporary ground escape 200 feet long will be made at the west end with slabs and stones, the bund being cut down to F.T.L. The ground has a slope of 4 feet a mile below, but it is believed that a ground escape fit to stand a season can be constructed for the sum provided, viz., Rs. 400. Next year it will be necessary to build a permanent weir, for which there is neither time or money this year.

The Venkatagiri river entered through the old supply channel which is useless during moderate freshes. It will be dammed across.

(Signed) C. H. D. MARJORIBANKS,
Executive Engineer.

23rd June 1894.

No. 406 N.L.

Forwarded to the Chief Engineer for Irrigation for favour of obtaining sanction of Government to the estimate, amounting to Rs. 8,140, for improving Chennur tank in the Nellore division, which was seriously damaged by the heavy rains of last November.

2. An estimate, amounting to Rs. 15,900, for improvements to this tank and its supply channel was forwarded with this office No. 274 N.L., dated 20th July 1893, but was returned with No. II/57 N L., dated 14th November 1893, with the remark that the idea of repairing and improving the channel may be abandoned and the tank repaired.

3. The Executive Engineer fully explains the necessity for the improvements to the tank now proposed.

(Signed) W. L. C. BADDELEY, Major, R.E.,
12th September 1894. Superintending Engineer, II Circle.

No. 110 I.

Submitted to Government. The amount of the estimate has been reduced in this office from Rs. 8,140 to Rs. 7,380. The reduction is due to the provision made for new heads to existing sluices being eliminated from the estimate.

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
6th Oct. 1894. Chief Engineer for Irrigation.

ORDER—dated 7th November 1894, No. 849 I., Public Works.

The following estimate is sanctioned :—

Irrigation.
43. Minor Works and Navigation.
Minor Works for which neither Capital nor Revenue Accounts are kept, P.W.D.
Nellore Division.
Original Works.

	RS.
Improving Chennur tank, No. 174 of list of works appended to G.O., No. 407 I., dated 6th July 1889, estimate	7,380

2. This sanction is registered as No. 107 I. of 1894–95.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
„ Superintending Engineer, II Circle, with four enclosures.
„ Examiner, Public Works Accounts.
„ Revenue Department.

No. 406 S.I.

Forwarded to the Chief Engineer for Irrigation for favour of obtaining sanctio[illegible] of Government to the estimate, amounting to Rs. 8,140, for improving Chunnar tan[illegible] in the Nellore division, which was seriously damaged by the heavy rains of la[illegible] November.

2. An estimate, amounting to Rs. 14,590, for improvements to this tank and i[illegible] supply channel was submitted with this office No. 274 S.I., dated 20th July 189[illegible] but was returned with No. 1135 S.I., dated 11th November 1893, with the remar[illegible] that the idea of repairing and improving the channel may be abandoned and the tan[illegible] repaired.

3. The Executive Engineer fully explains the necessity for the improvements t[illegible] the tank now proposed.

(Signed) W. L. C. BADDELEY, Major, R.E.,
12th September 1894. Superintending Engineer, II Circle,

No. 119 I.

Submitted to Government. The amount of the estimate has been reduced in this office from Rs. 8,140 to Rs. 7,880. The reduction is due to the provision made fo[illegible] new works in raising sluices being eliminated from the estimate.

(Signed) R. H. F. DRAKE-BROCKMAN, Colonel, R.E.,
8th Oct. 1894. Chief Engineer for Irrigation.

Order—dated 7th November 1894, No. 219 I., Public Works.

The following estimate is sanctioned:—

Irrigation.
45. Minor Works and Navigation.
Minor Works for which neither Capital nor Revenue accounts are kept, P.W.D.
Nellore division.
Original Works.

Improving Chunnar tank, No. 173 of list of works appended to G.O. No. 197 I., dated 6th July 1893, estimate ... Rs.

2. This sanction is registered as No. 107 I. of 1894–95.

(True Extract.)

(Signed) R. H. F. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, II Circle, with four enclosures.
" Examiner, Public Works Accounts.
" Revenue Department.

IRRIGATION.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated November, 7th.

Recd. *Encl.*

G.O., 7th Nov. 1894, No. 849 I.

NOVEMBER.

Chennur Tank

Estimate of Rs. 7,380 for improving —, Nellore division, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

Read—the following paper :—

From Major W. L. C. BADDELEY, R.E., Superintending Engineer, II Circle, to the Chief Engineer for Irrigation, dated Bezwada, 14th August 1894, No. 1129 K.S.

I have the honour to forward herewith, for your approval and sanction of Government, an estimate, amounting to Rs. 4,220, for constructing a wharf on the right side of the Ryves' canal above the new bridge in the first mile, and to request that you will be so good as to sanction it from the balance available for unforeseen works of the Kistna delta system.

2. The report which accompanies the estimate explains the necessity for the work.

3. Wharves are much wanted throughout the system of canals in the Kistna and it is to be hoped that in the course of the next two or three years this want will be supplied.

Enclosure.

Report to accompany estimate amounting to Rs. 4,220 for constructing a wharf wall on right side of Ryves' canal in the first mile.

The length of the proposed wharf is to be 200 feet as finally decided by the municipal councillors on inspection of the locality, and the site fixed for the same is 185 feet from the new bridge.

2. The wharf wall is to be built in continuation of the line of the tow path wall of the bridge and the wharf is to have a clear width of 40 feet and is to be 10·75 feet above the bed of canal. The wharf is to be connected on one side with the road leading from the bridge to Buckinghampett by a metalled ramp 25 feet wide with gradient of 1 in 15. The slopes on both sides of the ramp and that of the wharf are to be revetted with rough stone and rubbish. The ends of the wharf wall are to be finished with rough stone revetment 25 feet long as shown in the site plan.

The estimate provides for all that is necessary for a wharf and also for removal of the old bank from the bridge to the other end of wharf and spreading the spoil on the municipal ground between canal and Ellore road and on the ground beyond the road.

(Signed) A. H. MORIN.

(Signed) T. W. S. SMYTH,
Ex. Engr., Northern Divn., Kistna.

ORDER—dated 7th November 1894, No. 850 I., Public Works.

The following estimate is sanctioned from the balance of the amount reserved for unforeseen works of the Kistna delta system, which will then be reduced to Rs. 1,00,770 :—

Capital Expenditure not charged to Revenue.
49. Irrigation.
Kistna Delta System.
Eastern Section.
I. Works.
2. Main Canals and Branches, Ryves' Canal.
9. Navigation Works.

	RS.
Constructing a wharf wall on the right side of the canal above the new bridge in the first mile, estimate	4,220

2. This sanction is registered as No. 109 I. of 1894–95.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
,, Superintending Engineer, II Circle, with estimate.
,, Examiner, Public Works Accounts.
,, Revenue Department.

IRRIGATION.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated November, 7th.

Recd. *Encl.*

G.O., 7th Nov. 1894, No. 850 I.

NOVEMBER.

Ryves' Canal

Estimate of Rs. 4,220 for constructing a wharf wall on the right side of the — above the new bridge in the first mile, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

Read—the following paper :—

From the Executive Engineer, Buckingham Canal, to the Superintending Engineer, II Circle, dated 7th August 1894, No. 1222.

I have the honour to submit for sanction an estimate for copper sheathing ten pairs of gates on the Buckingham canal in south and north sub-divisions, amounting to Rs. 8,200, as detailed in estimate.

2. This estimate is now submitted as it is found that some of the gates should now be copper sheathed without delay, and funds are available this year (owing to savings on works) for so doing.

3. The estimate fully completes the list of gates to be copper sheathed, the estimates sanctioned in G.Os., No. 1047 I., dated 12th December 1892, and No. 142 I., dated 15th February 1894, having made provision for copper sheathing all other gates.

4. New gearing for the Swarnamukhi north gate is provided in estimate, as existing gearing is obsolete and very slow in working.

5. The amount of the estimate can be met from reserve at the disposal of Government.

No. 179 B.C.

Forwarded to the Chief Engineer for Irrigation for favour of obtaining the sanction of Government to the estimate from the balance available with Government for unforeseen works of Buckingham canal.

(Signed) W. L. C. BADDELEY, Major, R.E.,
Superintending Engineer, II Circle.

18th August 1894.

ORDER—dated 7th November 1894, No. 851 I., Public Works.

The following estimate is sanctioned from the balance of the amount reserved for unforeseen works of the Buckingham canal, which will then be reduced to Rs. 1,20,815 :—

Irrigation.
43. Minor Works and Navigation.
Minor Works for which Capital and Revenue Accounts are kept.
Buckingham Canal.
Capital Account.
I. Works.
2. Main Canals and Branches.
9. Navigation Works.

	RS.
Sheathing ten flood gates with copper, estimate	8,200

2. This sanction is registered as No. 108 I. of 1894–95.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
„ Superintending Engineer, II Circle,
with one estimate.
„ Examiner, Public Works Accounts.
„ Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated November, 7th.

Recd. *Encl.*

G.O., 7th Nov. 1894, No. 851 I.

NOVEMBER.

Flood Gates

Estimate of Rs. 8,200 for sheathing ten — on the Buckingham canal with copper, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following paper :—

From A. H. GARRETT, Esq., Superintending Engineer, I Circle, to the Chief Engineer for Irrigation, dated Dowlaishweram, 13th September 1894, No. 1178 G.D.

I have the honour to submit herewith the annual statements, Parts I and II, together with the abstract for the irrigation and navigation floating plant, for the ensuing official year 1895–96.

2. The probable cost of maintenance of floating plant for 1895–96 is estimated at Rs. 17,867 exclusive of the cost of upkeep of ferry ballacuts on different canals. The required funds will be applied for in the budget.

ENCLOSURES.

RETURN No. 27.

STATEMENT of the irrigation floating plant in the Gódávari district showing the estimated cost of upkeep during the year 1895–96.

Part I—Steamers and Steam Dredgers

Registered No.	Details of plant.		Value of plant.		Probable cost of upkeep in 1895–96.	Remarks.
	Description.	Names of steamers, &c.	Original.	Present book value.		
1	2	3	4	5	6	7
		Irrigation.	RS.	RS.	RS.	
	Steamer ..	"Shamrock"	20,014	7,544	860	In working order.
	Steamer ..	"Arthur Cotton"	9,535	6,480	430	In working order.
	Steamer ..	"Victoria"	50,956	18,214	910	In working order.
	Steam tug ..	"John Mullins"	31,054	18,306	920	In working order.
		Total ..	..	..	3,120	
1	Dredger ..	Canal iron dredger, double bucket ladder, side delivery.	26,373	2,358	460	Boiler condemned—*vide* this office letter to Chief Engineer for Irrigation, No. 350 G.D., dated 10th May 1894.
2	Dredger ..	Canal iron dredger, single bucket ladder, end delivery.	15,395	1,545	460	In working order.
	Dredger ..	Canal iron dredger, single bucket ladder, side delivery.	30,437	5,225	460	In working order.
3	Dredger ..	Do. do. ..	30,437	5,689	460	In working order.
4	Dredger ..	Do. do. ..	30,437	3,864	460	In good working order; lately repaired.
5	Dredger ..	Do. do. ..	31,097	4,825	460	Lent to Buckingham division.
6	Dredger ..	Priestman's size B. ..	16,580	4,664	460	In working order.
	Dredger ..	Do. size A-1 .	13,438	5,964	460	In working order.
	Dredger ..	Do. size A-2 .	16,120	11,647	460	In working order.
		Total ..	..	..	4,140	
		Grand Total ..	..	..	7,260	

Rules for finding present book value.

(1) Steamers to be reduced 10 per cent. every year, and the amount of special repairs, if any, must be added thereto.

(2) Steam dredgers to be reduced 15 per cent. every year, and the amount of special repairs, if any, must be added thereto.

STATEMENT of the irrigation floating plant in the Gódávari district showing the estimated cost of upkeep during the year 1895–96.

Part II—Barges, Boats and Punts.

Registered No.	Description of boats.	Value of plant.		Probable cost of upkeep in 1895–96.	Remarks.
		Original.	Present book value.		
	Irrigation.	RS.	RS.	RS.	
1	Iron flat	6,243	1,869	140	In good working order; lately repaired.
3	Canal iron punt	2,811	769	120	Under repairs.
5	Do.	2,812	1,575	120	In working order.
7	Do.	2,812	1,870	120	
10	Do.	2,812	1,282	120	In good working order; lately repaired.
11	Do.	2,812	1,402	120	
13	Iron dredge punt	2,310	1,242	75	In working order.
15	Canal iron punt	2,812	1,117	120	In good working order; lately repaired.
17	Do.	2,812	2,051	120	In working order.
18	Iron dredge punt	2,310	698	75	
20	Canal iron punt	2,812	1,134	120	In good working order; lately repaired.
21	Iron dredge punt	2,310	990	75	In working order.
22	Do.	2,310	573	75	
25	Canal iron punt	2,811	1,289	120	In good working order; lately repaired.
27	Do.	2,811	1,379	120	
30	Do.	2,811	1,602	120	In working order.
31	Do.	2,811	920	120	Under repairs.
34	Iron flat	4,693	2,074	130	In good working order; lately repaired.
36	Canal iron punt	2,812	1,016	120	
37	Do.	2,812	1,557	120	
38	Do.	2,812	773	120	Under repairs.
39	Do.	2,812	889	120	In good working order; lately repaired.
40	Iron deep boat	4,693	2,581	190	In working order.
44	Wooden deep boat	2,830	2,139	170	
47	Do.	2,000	3,021	170	In good working order; lately repaired.
48	Do.	2,000	2,791	170	
49	Do.	2,000	2,824	170	
50	Do.	2,117	2,158	170	
65	Iron light boat	1,000	834	70	In working order.
66	Do.	1,000	850	70	
67	Do.	1,000	925	70	
68	Do.	1,000	848	70	
69	Do.	1,000	880	70	
70	Do.	1,000	697	70	
71	Do.	1,433	849	70	
72	Do.	1,433	526	70	
74	Do.	1,000	808	70	
75	Do.	1,000	486	70	
77	Wooden light boat	750	550	75	In good working order; lately repaired.
81	Iron flat	7,375	1,526	140	
82	Wooden flat	2,722	1,764	150	In working order.
83	Do.	2,722	1,603	150	Under repairs.
84	Do.	2,722	2,061	150	In working order.
85	Do.	2,722	2,253	150	In good working order; lately repaired.
86	Do.	2,722	1,612	150	Under repairs.
87	Do.	2,722	1,928	150	In good working order; lately repaired.
88	Do.	2,800	2,142	150	
89	Do.	2,800	2,209	150	
90	Do.	2,800	1,711	150	In working order.
91	Do.	2,800	2,498	150	
92	Do.	2,800	1,717	150	
93	Do.	2,800	1,933	150	In good working order; lately repaired.
94	Do.	2,405	1,882	130	In working order.
95	Do.	2,405	2,219	130	
99	Do.	2,405	2,378	130	In good working order; lately repaired.
100	Iron double trap punt	4,185	1,286	110	
101	Do.	4,185	1,491	110	
104	Do.	4,060	1,615	110	
105	Iron punt	6,960	3,344	140	
12	Second-class staff boat	820	..	150	In working order.
13	Do.	820	..	150	
14	First-class staff boat	1,400	..	230	
15	Second-class do.	800	..	150	
16	First-class do.	1,250	..	230	
17	Second-class do.	850	..	150	
18	First-class do.	1,400	5	230	
19	Second-class do.	850	..	150	
20	First-class do.	1,400	123	230	
21	Second-class do.	840	70	150	
22	First-class do.	1,783	1,042	230	
23	Do. do.	1,780	1,484	230	
	Total ..	..	..	9,385	

Part II—Barges, Boats and Punts—cont.

Registered No.	Description of boats.	Value of plant. Original.	Value of plant. Present book value.	Probable cost of upkeep in 1895-96.	Remarks.
	Irrigation—cont.	RS.	RS.	RS.	
A	Upper Gódávari barge	3,500	5,365	340	In working order.
D	Do.	3,500	4,320	340	
E	Do.	3,500	5,040	340	
	Total ..	..	..	1,020	
2	Jolly boat	165	130	20	In working order.
3	Do.	340	258	16	
4	Do.	165	192	20	Under repairs.
5	Do.	Unknown.	..	16	
6	Survey Nava	300	211	35	In working order.
7	Do.	300	162	35	
8	Jolly boat of steam tug "John Mullins"	Unknown.	..	60	
	Total ..	..	..	202	
	Grand Toral ..	..	..	10,607	

Rules for finding present book value.

(1) Boats and barges to be reduced 10 per cent. every year, and the amount of special repairs, if any, must be added thereto.

(2) Staff boats to be reduced by one-twelfth of their original cost for each year of their life.

(Signed) W. JONES,
Boat Superintendent.

7th August 1894.

(Signed) C. J. USSHER,
Executive Engineer.

(Signed) J. M. M. PARKER,
Assistant Engineer.

DETAILED approximate estimate of the annual cost of maintenance of the irrigation floating plant, Gódávari district.

Particulars.	Steamer "Shamrock."	Steamer "Victoria."	Steam Launch "Arthur Cotton"	Steam Tug "John Mullins."	Canal dredgers.	Barges.	Canal punts.	Dredge punts, 30 feet long.
1	2	3	4	5	6	7	8	9
Docking and launching	50	50	50	50	50	25	12	10
Painting	500	500	195	5 0	120	150	31	20
Caulking	70	44	18	80	50	30	36	20
Varnishing	..	20	..	..	..	..	..	..
Tarring	..	..	..	..	50	50	20	10
Ropes, &c.	30	30	30	30	30	58	11	10
Lascars	..	..	..	..	20	..	..	..
Small stores	..	..	..	..	12	..	..	..
General charges	60	66	37	60	28	27	10	5
Sundry repairs	150	200	100	150	100	..	..	..
Total ..	860	910	430	920	460	340	120	75

Particulars.	Wooden light boats.	Iron light boats.	Wooden flats, 74 feet long.	Staff boats, first class.	Staff boats, second class.	Iron deep boats.	Iron flats Nos. 1 and 81 and iron punt No. 105.	Jolly boat No. 8.
1	10	11	12	13	14	15	16	17
Docking and launching	10	10	15	10	10	30	15	5
Painting	..	20	..	110	65	63	45	30
Caulking	40	10	110	40	33	20	36	18
Varnishing	..	..	..	10	..	..	..	..
Tarring	..	10	..	..	..	27	19	..
Ropes, &c.	20	10	14	10	12	37	14	2
Lascars	..	..	..	..	..	..	..	..
Small stores	..	..	..	..	..	..	..	..
General charges	5	10	11	20	10	13	11	5
Sundry repairs	..	..	..	30	20	..	..	..
Total ..	75	70	150	230	150	190	140	60

Particulars.	Double trap punts.	Wooden flats, 60 feet 3 inches long.	Iron flat, 60½ feet long.	Wooden deep boats.	Jolly boats Nos. 2 and 4.	Jolly boats Nos. 3 and 5.	Survey Navas.
1	18	19	20	21	22	23	24
Docking and launching	12	15	12	25	..	..	5
Painting	30	..	35	..	8	..	..
Caulking	30	90	40	99	8	12	24
Varnishing	..	..	..	..	..	..	..
Tarring	20	..	20	..	..	..	..
Ropes, &c.	10	14	15	34	4	4	6
Lascars	..	..	..	..	..	..	..
Small stores	..	..	..	..	..	..	..
General charges	8	11	8	12	..	..	..
Sundry repairs	..	..	..	..	..	..	..
Total ..	110	130	130	170	20	16	35

ABSTRACT showing the comparison of details between the estimated maintenance cost of floating plant in the Gódávari district for 1894–95 and 1895–96.

—	Number.		Original value.		Book value.		Cost of upkeep.	
	1895–96.	1894–95.	1895–96.	1894–95.	1895–96.	1894–95.	1895–96.	1894–95.
			RS.	RS.	RS.	RS.	RS.	RS.
Steamers	4	4	1,11,559	1,11.559	50,544	55,830	3,120	3,120
Dredgers	9	9	2,10,314	2,10,314	45,781	52,892	4,140	4,140
Barges A, D and E from Upper Gódávari works	3	3	10,500	10,500	14,725	16,360	1,020	1,020
Iron flats Nos. 1, 34 and 81	3	3	18,311	18,311	5,469	4,948	410	410
Do. punts Nos. 3, 5, 7, 10, 11, 15, 17, 20, 25, 27, 30, 31, 36, 37, 38, 39 and 105 ..	17	17	51,947	51,947	23,968	23,713	2,060	2,060
Iron dredge punts Nos. 13, 18, 21, 22 ..	4	4	9,240	9,240	3,503	3,890	300	300
Do. double trap punts Nos. 100, 101 and 104	3	3	12,430	12,430	4,392	4,030	330	330
Iron deep boat No. 40	1	1	4,693	4,693	2,581	2,867	190	190
Do. light boats Nos. 65 to 72, 74 and 75 ..	10	10	10,866	10,866	7,703	8,553	700	700
Wooden deep boats Nos. 44, 47 to 50 ..	5	5	10,447	10,447	12,933	11,376	850	850
Do. light boat No. 77	1	1	750	750	550	480	75	75
Do. flats Nos. 82 to 95 and 99 ..	15	15	40,347	40,347	29,910	29,369	2,190	2,190
Staff boats, 1st class, Nos. 14, 16, 18, 20, 22 and 23	6	6	9,013	9,013	2,654	3,184	1,380	1,380
Staff boats, 2nd class, Nos. 12, 13, 15, 17, 19 and 21	6	6	4,980	4,980	70	210	900	900
Jolly boats and survey navas Nos. 2 to 8 ..	7	7	1,270	1,270	953	873	202	202
Total ..	94	94	5,06,667	5,06,667	2,05,736	2,18,575	17,867	17,867

ORDER—dated 7th November 1894, No. 852 I., Public Works.

The estimate of the cost of maintaining the floating plant of the Gódávari delta system is approved; Rs. 17,867 will be provided on this account in the budget estimates for "Major Works" for 1895–96.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, I Circle.
" Examiner, Public Works Accounts.

IRRIGATION.
ACCOUNT.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated November, 7th.

Recd. *Encl.*

G.O., 7th Nov. 1894, No. 852 I.

NOVEMBER.

Floating Plant

Estimate of the cost of maintaining the — of the Gódávari delta system for 1895-96, approved.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

READ—the following paper :—

From J. C. LARMINIE, Esq., Superintending Engineer, V Circle, to the Chief Engineer for Irrigation, dated Chepâk, 27th July 1894, No. 283 E.I.

Adverting to paragraph 156 B., chapter XV, volume II of the Code, I have the honour to submit for sanction and allotment of funds under the open capital account enclosed estimate, with accompaniments as per margin, for reconstructing the old dam across Iyavayanar for the efficient irrigation of the lands under Sembathaniruppu channel in Shiyâli taluk, Tanjore division.

1 report.
1 calculation sheet.
1 detail estimate.
1 abstract estimate.
1 plan of dam.
1 survey.
—
6
—

2. The cost of the original works now in ruins, the Executive Engineer reports, can be taken at Rs. 1,000.

3. If the estimate is sanctioned and funds allotted at an early date, the work will be completed by 31st December 1895.

The work is a reconstruction so must be considered as unremunerative.

4. The mirasidars interested in the reconstruction of the dam have already contributed Rs. 1,930 towards payment of the moiety of the cost. The difference still to be paid by them will be recovered before work is put in hand.

ENCLOSURE.

REPORT to accompany the estimate for reconstructing the old dam across Iyavayanar for the efficient irrigation of the lands under Sembathaniruppu channel.

	RS.
Amount of estimate	3,800

Sembathaniruppu channel takes off the Iyavayanar L.B. above head of Nundodiar. The lands under it (about 1,300 acres) being on too high a level and the river bed very low, they had formerly a masonry dam across the river to raise the water to the level suited to the height of the nunja lands. The dam is now in a ruined state and the ryots concerned find it extremely difficult to secure proper supply to their lands without the dam, and for the last 10 or 12 years and more the ryots have been badly suffering. The level of the nunja lands ranges between 46·50 and 48·00, while the average level of the river bed is 43·00. It is absolutely necessary that they should have their old dam across the river properly reconstructed.

2. The accompanying plans and estimate are accordingly prepared and submitted for reconstructing it just above their old ruined dam. The dam is designed with screw shutters to the level of full supply required, so that they may be fully raised clear of the M.F.L. without in any way obstructing the free passage of high floods. As there is irrigation under the river below this proposed dam the working of the shutters at it should be on a "morai."

Note.—Water-way allowed in the regulation is nearly the same as that under the aqueducts in the river altered last year.

3. *Specification.*—Work will be done according to the standard specification.

The ryots have already contributed a moiety of the amount with centage charges amounting to Rs. 2,353.

(Signed) T. T. RAGHAVACHARIYAR,
Sub-Engineer.

31st December 1892.

(Signed) J. C. JOHNSTON,
Ex. Engr., Tanjore Division.

18th June 1894.

No. 123 I.

Submitted to Government. The amount of the estimate has been slightly increased in this office from Rs. 3,780 to Rs. 3,800.

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Chief Engineer for Irrigation.

24th Oct. 1894.

ORDER—dated 7th November 1894, No. 853 I., Public Works.

The following estimate is sanctioned, a moiety of the proposed outlay on the work, viz., Rs. 2,365, being met from contributions from the ryots interested in its execution :—

49. Capital Expenditure not charged to Revenue.
49. Irrigation.
Cauvery Delta System.
Open Capital Account.
4. Drainage and Protective Works.
3. Works.
Unremunerative Work.
Reconstructing the old dam across the Iyavayanar.

	RS.
I. Works	3,800
II. Establishment	874
III. Tools and Plant	57
Total, estimate ...	4,731

2. This sanction is registered as No. 111 I. of 1894–95 and will expire on the 31st March 1896.

3. As there are no funds available at present to allot to the work, its execution will be deferred.

4. The assumed cost of the original work, viz., Rs. 1,000, will be written back by the Examiner of Public Works Accounts from the "Capital" to the "Revenue Account" of the Cauvery delta system in accordance with paragraph 156 B., chapter XV, Public Works Department Code.

5. Ordered that a copy of these Proceedings be forwarded to the Government of India for information.

[Here enter No. 854 I., dated 7th November 1894.]

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, V Circle, with six enclosures.
" Examiner, Public Works Accounts.
" Revenue Department.

ENDORSEMENT—dated 7th November 1894, No. 854 I., Public Works.

Forwarded.

(By Order.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

IRRIGATION.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated November, 7th.

Recd. *Encl.*

G.O., 7th Nov. 1894, Nos. 853, 854 I.

NOVEMBER.

Old dam across the Iyavayanar

Forwarding copy of Proceedings sanctioning, with remarks, the estimate of Rs. 4,731 for reconstructing the —, Cauvery delta system.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

Read—the following paper :—

No. 121 I.

Note by the Chief Engineer for Irrigation.

The accompanying statements showing progress on Tank Restoration operations during the year ending 31st March 1894 are submitted for the information of Government.

2. At the end of the previous year, the area of minor basins entered upon was approximately 31,997 square miles, of which 26,874 square miles had been completely investigated. These figures had advanced to 33,198 square miles and 29,668 square miles, respectively, at the close of the year under review.

3. The amount of estimates sanctioned during the year was Rs. 4,04,025, all of which were for Government works. The cost of establishment, &c., employed on investigation was Rs. 62,581, or 15·4 per cent. of the amount of estimates sanctioned.

4. The total amount of estimates sanctioned from the commencement of Tank Restoration operations to 31st March 1894 was Rs. 42,87,343, from which has to be deducted Rs. 1,19,403, the amount of estimates formerly prepared for zemindari works, as explained in paragraph 4 of the note on the progress of Tank Restoration operations printed with G.O., No. 208 I., dated 28th March 1890, and Rs. 8,794, the amount of estimates prepared under G.O., No. 236 I., dated 9th March 1892, for works in the Yelagiri mittah, Salem district, leaving Rs. 41,59,146 as the amount of estimates sanctioned for Government works.

5. During the year No. I Party continued the investigation of the Madura and Sholavandan minor basins in the Madura district; No. II Party proceeded with the investigation of the Uppatur and Nichabanadi minor basins in Tinnevelly; No. IV and No. V Parties together completed the investigation of the Pattukkóttai and Vellár minor basins in Tanjore and were retransferred in November 1893 to Salem and North Arcot respectively, No. IV Party resuming its operations in the Pambar minor basin, Salem district, and No. V Party re-entering the Vellore minor basin, North Arcot district; No. VII Party completed the investigation of the Guntúr, Mattswaram, Tadikonda, Guruzala and Macherla minor basins, all in the Kistna district, and was abolished at the close of the year to allow of Tank Restoration investigation being resumed in the Chingleput district; No. VIII Party continued to work in the Lower Sarada minor basin and started work in the Kondakirla and Upper Varaha minor basins in the Vizagapatam district under the orders of the Executive Engineer of that division.

6. Statement B shows the estimated cost of the work of restoration in the basins, the investigation of which is finished or very nearly so, and column 4 in it shows the actual expenditure on these works.

7. The total expenditure on execution (excluding establishment charges and tools and plant) to the end of March 1894 was Rs. 29,58,690, showing Rs. 12,00,456 as the apparent unexpended balance of estimates available for execution, but the actual balance, as given by Executive Engineers in special statements submitted by them, amounts approximately to Rs. 9,65,539. The difference between these two figures is accounted for by the surrender of various savings on such of the estimates as had been worked out and closed.

8. The balance of estimates received but not dealt with in the Central office on 31st March 1894 was Rs. 50,726. The amount added to that of the approximate balance of unexecuted sanctioned estimates, as given by Executive Engineers, gives Rs. 10,16,265 as the amount by which investigation was ahead of execution at the end of March 1894.

9. The total amount of expenditure, Rs. 29,58,690, on execution entered in this note has been obtained from the Examiner, Public Works Accounts, but the amounts of expenditure aggregating to Rs. 29,59,472, shown in column 12 of the large tabular statement, are as given in statements submitted by Superintending Engineers for minor basins. The difference, Rs. 782, calls for no special explanation.

10. The progress made in the printing of plates and memoirs is as follows: —

Plates and descriptive memoirs—	
Previously printed	17
During the year	4
Descriptive memoirs in the press	1
Plates printed	3
Plates under preparation	3

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Chief Engineer for Irrigation,
Tank Restoration Scheme.

15th Oct. 1894.

STATEMENT showing progress in the Tank Restoration operations (investigation and execution) up to 31st March 1894.

Basin.	Minor basin.	Area of minor basin.	Approximate area completed.	Progress made in investigation.	Progress made in execution.						
					Estimates sanctioned and sent for execution up to 31st March 1894.		Deduct estimates of zemindari and private works.		Total estimates handed over to Public Works Department for execution.		Estimates worked out.
					Number.	Amount.	Number.	Amount.	Number.	Amount.	Amount.
1	2	3	4	5	6	7	8	9	10	11	12
						RS.		RS.		RS.	RS.
Upper Vaigai river	Periyakulam	192	192	Investigations completed ; plates and memoirs printed	57	40,571	1	250	56	40,321	43,026
	Butlagundu	208	208		50	48,792	8	15,197	42	33,595	30,436
	Suruliyár	501	504		60	1,89,470	4	15,652	56	1,73,818	1,74,790
	Talavaigai	256	256		8	21,689	8	21,689	..	..	..
	Andipatti	144	144		19	40,327	8	9,734	11	30,593	30,168
Amarávati river	Udamalpet	400	400	Do. do.	10	46,184	..	..	10	46,184	46,671
	Palni	304	304	Investigations completed ; plates partly printed and part under preparation, draft memoirs being revised ..	53	1,38,020	13	6,045	40	1,31,975	1,28,125
	Upper Amarávati	656	656	Investigations completed ; plates and memoirs printed ..	3	10,170	1	1,312	2	8,828	8,484
	Dindigul	432	432	Investigations completed	430	2,06,127	1	42	429	2,05,085	1,97,665
	Dhárápuram	250	250	Investigations completed ; estimates amounting to Rs. 1,55,200 were prepared, but as the works were found to be beyond the scope of the Tank Restoration Scheme, the estimates were sent to the Executive Engineer, Coimbatore division, for disposal	..	..	..	..	..	..	..
	Kangayam	180	180	All the works connected with this minor basin are abandoned, and as there had been no cultivation under them for 10 years prior to the minor basin being taken up, they were not investigated	..	..	..	..	..	..	..
	Karúr	191	191	Investigations completed ; estimates for two channels, amounting to Rs. 90,000, were prepared, but as they did not fall within the scope of the Tank Restoration Scheme, the estimates were sent to the Executive Engineer, Coimbatore division, for disposal ; of the remaining works, one is a private work and the rest were found to be unimportant	1	1,278	1	1,278	..	..	..
	Mulanur	259	259	Investigations completed ; of the 27 works in this minor basin 25 were found to be unimportant	2	25,939	..	..	2	25,939	24,415
	Lower Kadavanar	250	250	Investigations completed	114	33,473	..	..	114	33,473	32,182
	Nanganjiar	268	268	Investigations completed ; plates printed and memoirs in press	11	22,230	..	..	11	22,230	19,346
	Nellatangi	204	204	Investigations completed ; plates and memoirs printed ..	3	11,165	..	..	3	11,165	11,069
Upper Gundaur	Tirumangalam	300	300	Investigations completed	150	1,83,726	..	..	150	1,83,726	1,38,180
Mid Vaigai	Madura	134	110	Investigations in progress	33	43,163	..	..	33	43,163	13,712
	Sholavandan	316	150	Do. do.	..	..	..	..	..	..	..

Statement showing progress in the Tank Restoration operations (investigation and execution) up to 31st March 1894—*cont.*

Basin.	Minor basin.	Area of minor basin.	Approximate area completed.	Progress made in investigation.	Progress made in execution. Estimates sanctioned and sent for execution up to 31st March 1894 — Number.	Estimates sanctioned … — Amount.	Deduct estimates of zemindari and private works — Number.	Deduct estimates … — Amount.	Total estimates handed over to Public Works Department for execution — Number.	Total estimates … — Amount.	Estimates worked out — Amount.
1	2	3	4	5	6	7	8	9	10	11	12
						RS.		RS.		RS.	RS.
Vaipaur	Arjunanadi	872	872	Investigations completed	196	2,86,649	..	..	196	2,86,649	1,22,387
	Uppattur	384	140	Do. in progress	11	5,150	..	..	11	5,150	98
	Nichabanadi	576	150	Do. do.	..	..	..	..	..	..	..
Noyel river	Upper Noyel	296	296	Do. completed; plates and memoirs printed ..	24	75,255	..	..	24	75,255	62,251
	Avanashi	320	320	Do. do. do. ..	40	32,693	..	..	40	32,693	27,908
	Uttukuli	182	182	Do. do. do. ..	11	5,900	..	..	11	5,900	4,580
	Tirupur	250	250	Do. do. do. ..	11	20,327	..	..	11	20,327	18,847
	Lower Noyel	256	256	Investigations completed. All the works in this minor basin are either abandoned or private	..	..	..	..	..	..	..
Bhavâni river	Satyamangalam ..	384	384	Investigations completed; plates and memoirs printed ..	7	22,561	..	..	7	22,561	21,583
	Upper Bhavâni	772	772	Do. do. ..	5	6,101	..	..	5	6,101	5,852
	Manjaur	628	628	Investigations completed; there are no irrigation works in this minor basin	..	..	..	..	..	..	..
	Koduveri	456	456	Investigations completed, plates printed and memoirs prepared	5	4,465	..	..	5	4,465	3,777
Honhulla	Honhulla	652	652	Investigations completed; plates and memoirs printed ..	16	30,424	..	..	16	30,424	27,776
Tadakarai	Tadakarai	360	360	Investigations completed; there are 12 anicuts and channels in this minor basin, all of which having been abandoned (for half a century) prior to the investigation, nothing was proposed to be done to them	..	..	..	..	..	..	..
Umbattahalli river ..	Umbattahalli river ..	624	624	Investigations completed; there are no irrigation works belonging to Government in this minor basin ..	..	..	..	..	..	..	..
Minor drainages No. 79 ..	Minor drainages No. 79 ..	256	256	Do. do. do. ..	..	..	..	..	..	..	..
Do. " 80 ..	Do. " 80 ..	192	192	Do. do. do. ..	..	..	..	..	..	..	..
Do. " 81 ..	Do. " 81 ..	320	320	Investigations completed	5	2,344	..	..	5	2,344	1,941
Basin No. 67 A ..	Alayar	360	360	Do. do.	7	21,364	..	..	7	21,364	21,095
	Varattar	420	420	Do. do.	1	1,116	..	..	1	1,116	1,246
Thirumanimuthaur ..	Thirumanimuthaur ..	769	769	Investigations completed; plates and memoirs under preparation	143	99,568	..	..	143	99,568	91,449
Ponniar river ..	Vaniar	600	600	Investigations completed	92	32,253	..	..	92	32,253	15,934
	Pambar	696	680	Do. almost completed	249	72,508	10	7,884	239	64,624	11,000
	Markandanadi minor basin.	276	20	Do. just begun	..	..	..	..	..	..	..
	Villupuram	256	256	Do. completed	102	2,46,953	..	..	102	2,46,953	1,10,888
Madras drainage basin.	Kovalam	190	190	Investigations completed; plates and memoirs printed ..	162	1,71,804	20	13,542	142	1,58,262	1,57,348
	Red Hills	337	337	Do. do. plates partly printed ..	232	3,03,766	22	19,344	210	2,84,422	2,67,142
	Adayar	192	192	Do. do. plates under preparation; memoirs lately begun	208	2,35,642	27	14,995	181	2,20,647	2,06,141

Pálár	Sembrambakkam	317	317	Investigations completed	156	2,01,026	..	..	156	2,01,026	1,01,148
	Tiruttani	304	304	Investigations completed; preparation of plates and memoirs progressing towards completion	113	1,72,965	..	..	113	1,72,965	1,58,503
	Ponnai anicut, eastern	240	240	Investigations completed	125	1,64,636	..	..	125	1,64,636	1,53,224
	Vellore	492	460	Do. almost completed	105	1,07,530	2	910	103	1,06,620	25,216
	Amboordroog minor basin	640	..	Do. just begun	..	..	..	..	..	..	..
	Upper Kundaur	436	436	Do. completed; plates and memoirs printed	15	25,711	..	..	15	25,711	23,027
	Kauli	406	406	Do. do. do.	21	66,601	..	..	21	66,601	65,955
	Sirvel	652	630	Investigations completed with the exception of that of three tanks which were left uninvestigated owing to the abolition of Party No. III which was working in the district at the close of 1889–90	36	38,130	..	..	36	38,130	37,069
Kundaur river	Suruaur	436	436	Investigations completed	5	1,117	..	..	5	1,117	1,068
	Koilkuntla	395	395	Do.	8	3,813	..	..	8	3,813	3,711
	Nossam	312	312	Investigations completed with the exception of two works which were left uninvestigated owing to the abolition of No. III Party which was working in the district	21	9,715	..	..	21	9,715	9,381
	Eastern Kundaur	276	276	Investigations completed	8	6,867	..	..	8	6,867	6,673
	Western Kundaur	271	250	Investigations partly completed; five tanks were left uninvestigated owing to the abolition of the party which was working in the district	4	2,827	..	..	4	2,827	2,730
Minor drainages No. 25	Minor drainages No. 25	1,182	1,150	Investigations almost completed; three tanks were not investigated owing to the abolition of No. III Party which was working in the district	29	11,589	..	..	29	11,589	12,169
Do. " 28	Do. " 28	64	64	Investigations completed; there are no irrigation works in this minor basin	.. 2	.. 418	..	..	.. 2	.. 418	.. 353
Do. " 29	Do. " 29	128	128	Investigations completed	7	2,889	..	..	7	2,889	2,798
Minor drainages " 29 A.	Do. " 29 A.	780	400	Investigations partly completed; works stopped owing to the abolition of No. III Party	33	21,487	..	..	33	21,487	17,989
Hindri river	Dhonavogu	368	368	Investigations completed; plates and memoirs printed	26	13,654	..	..	26	13,654	11,782
	Upper Hindri	632	632	Do. do.	18	11,034	1	293	17	10,741	9,774
	Lower do.	312	312	Do. do.							
Sagiléru river	Upper Sagiléru	648	500	Investigations partly completed; work was stopped owing to the abolition of No. VI Party at the close of 1889–90	30	27,009	..	..	30	27,009	26,097
	Lower do.	600	..	Work was stopped owing to the abolition of No. VI Party	..	..	..	..	..	..	..
Pennér river	Pennér river	300	100	Only a few breached tanks were estimated for	4	16,241	..	..	4	16,241	16,999
Gódávari river	Tammileru	64	64	Investigations completed	36	26,596	..	..	36	26,596	26,369
	Biccavole	64	64	Do. do.	58	15,423	..	..	58	15,423	15,280
	Kolair	320	300	Investigations almost completed	24	12,565	..	..	24	12,565	11,680
	Torrigedda	340	320	Do. do.	49	34,460	..	..	49	34,460	14,486
Minor drainages No. 5.	Kondakirla	80	80	Investigations almost finished	2	860	..	..	2	860	..
	Upper Varaha	172	25	Do. in progress	..	..	..	..	..	..	..
	Lower "	128	128	Do. completed	59	40,913	..	..	59	40,913	37,769
	Lower Sarada	384	300	Do. in progress	26	64,835	..	..	26	64,835	11,075
Gundlakamma river	Vinukonda	396	396	Do. completed	30	24,060	..	..	30	24,060	20,035
	Chilakalurpad	352	352	Do. do.	30	21,715	..	..	30	21,715	11,047
Minor drainages No. 10.	Nadella	224	224	Do. do.	12	9,338	..	..	12	9,338	6,696
	Yedduvagu	288	288	Do. do.	15	14,455	..	..	15	14,455	..
	Guntúr	236	236	Do. do.	30	27,898	..	..	30	27,898	..
Kistna river	Mattsawaram	210	210	Do. do.	17	12,165	..	..	17	12,165	..
	Tadikonda	440	440	Do. do.	20	16,415	..	..	20	16,415	..

Statement showing progress in the Tank Restoration operations (investigation and execution) up to 31st March 1894—*cont.*

Basin.	Minor basin.	Area of minor basin.	Approximate area completed.	Progress made in investigation.	Progress made in execution. Estimates sanctioned and sent for execution up to 31st March 1894. Number.	Estimates sanctioned … Amount.	Deduct estimates of zemindari and private works. Number.	Deduct estimates … Amount.	Total estimates handed over to Public Works Department for execution. Number.	Total estimates … Amount.	Estimates worked out. Amount.
1	2	3	4	5	6	7	8	9	10	11	12
						RS.		RS.		RS.	RS.
Kistna river—*cont.*	Guruzala	320	320	Investigations completed	16	9,150	..	..	16	9,150	..
	Macherla	570	570	Do. do.	20	9,966	..	..	20	9,966	..
Minor drainage No. 47	Arani river	192	140	Investigations discontinued owing to the abolition of the special party under Superintending Engineer, V Circle; arrangements are being made for resuming work shortly in the minor basin	79	94,959	..	..	79	94,959	18,537
Minor drainage No. 90.	Pattukkóttai	640	640	Investigations completed	95	83,277	..	..	95	83,277	9,695
	Vellár river	263	263	Do. do.	108	1,24,867	..	..	108	1,24,867	13,625
	Total	33,198	29,668		4,023	42,87,343	127	1,28,197	3,896	41,59,146	29,59,472
	Total up to 31st March 1893	31,997	26,874		3,672	38,83,318	127	1,28,197	3,545	37,55,121	26,55,569
	Difference	1,201	2,794		351	4,04,025	..	..	351	4,04,025	3,03,903

Statement B showing the progress of execution of works in basins, the investigation of which was completed or very nearly so by 31st March 1894.

Districts.	Basins.	Estimates sanctioned and sent for execution up to 31st March 1894.	Expenditure.	Percentage worked out to total.
1	2	3	4	5
		RS.	RS.	
Madura	Upper Vaigai river	2,78,327	2,78,420	100
Madura and Coimbatore ..	Amarávati river	4,84,879	4,67,957	97
	Noyel river	1,34,175	1,13,586	85
Coimbatore	Bhaváni river	33,127	31,212	94
	Hounulla river	30,424	27,776	91
	Minor drainage No. 81	2,344	1,941	83
	Do. ,, 67 A	22,480	22,341	100
Salem	Thirumanimuthaur	99,568	91,449	92
Chingleput and North Arcot ..	Madras drainage basin *	12,01,958	10,43,506	87
Kurnool and Cuddapah	Kundaur river	1,54,781	1,49,614	97
Bellary and Kurnool	Minor drainages No. 25	11,589	12,169	100
Kurnool	Do. ,, 29	418	353	84
	Hindri river	45,882	39,545	86

* This basin is entered in the statement because investigation in it has for the time being stopped although some minor basins in it have not yet been entered upon.

Order—dated 7th November 1894, No. 855 I., Public Works.

Recorded.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
,, all Superintending Engineers.
,, the Examiner, Public Works Accounts.
,, the Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated November, 7th.

Recd. *Encl.*

G.O., 7th Nov. 1894, No. 855 I.

NOVEMBER.

Tank Restoration Operations

Review of the statements showing progress on — during the year ending 31st March 1894, recorded.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following paper :—

From Major O. V. BODDY, R.E., Superintending Engineer, VI Circle, to the Chief Engineer for Irrigation, dated Trichinopoly, 27th September 1894, No. 549 T.N.

Under Public Works Department Code, volume II, chapter XV, paragraph 156, clause II (1), I have the honour to submit, for the sanction of Government, a revised estimate, amounting to Rs. 2,880, together with plans and report, for constructing a rest-house with out-houses at Puthukudi, at the site of the head works of the Srívaikuntam anicut system, in lieu of one of Rs. 1,580 sanctioned in G.O., No. 1115 I., dated 18th December 1893.

2. The necessity for revising the original estimate is given in the Executive Engineer's report attached to the revised estimate. I have recently inspected the present building and am of opinion that it would be a waste of money to attempt to patch it up.

3. A sum of Rs. 1,580 has been allotted for the work in the final issue of the current year's budget, and I request that the balance of the revised estimate, viz., Rs. 1,300, may also be placed at the disposal of the Executive Engineer.

ENCLOSURE.

REPORT to accompany the revised estimate for improving the rest-house at Puthukudi.

	RS.
Amount of original estimate	1,580
Amount of revised estimate	2,880

The original estimate for renewing the roof, &c., of the building has been sanctioned in G.O., No. 1115 I., dated 18th December 1893, and the work put in execution.

The frames of the doors and windows are found to require thorough renewal and relieving arches over them are indispensably necessary for which no provision was made in the original estimate. Moreover, there are more doors and windows than wall, as will be seen in the sanctioned plan, so that pulling down the frames will be almost dismantling the building. Taking the above facts into consideration, it is thought that it will be much more economical to construct an entirely new building than to spend Rs. 1,580 in patching up the old one.

The present out-houses are entirely in ruins and no provision was made in the former estimate for new ones. This estimate provides for two new godowns and stables under the same roof at a cost of Rs. 785.

Early sanction is requested as the present rest-house is in a very precarious state and some materials have been collected under the sanctioned estimate.

(Signed) C. W. WOOD,
Ex. Engr., Tinnevelly Division.

13th September 1894.

Order—dated 7th November 1894, No. 856 I., Public Works.

The following revised estimate is sanctioned in supersession of the estimate of Rs. 2,000 sanctioned in G.O., No. 1115 I., dated 18th December 1893 :—

Capital Expenditure not charged to Revenue.
49. Irrigation.
Srívaikuntam Anicut System.
Open Capital Account.
Unremunerative Work.
I. Works.
I. Head Works.
4. Buildings.

Constructing a rest-house and out-houses at Puthukudi.

	RS.
Estimate	2,880
Establishment	662
Tools and plant	38
Total ...	3,580

2. This sanction is registered as No. 106 I. of 1894–95 and will expire on the 31st March 1896.

3. As there are no funds available during the current year to meet the balance of the revised estimate, the amount required will be included in the schedule of demands on Imperial funds for 1895–96.

4. Ordered that a copy of these Proceedings be forwarded to the Government of India for information.

[Here enter No. 857 I., dated 7th November 1894.]

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
„ Superintending Engineer, VI Circle, with eight enclosures.
„ Examiner, Public Works Accounts.
„ Revenue Department.

Endorsement—dated 7th November 1894, No. 857 I., Public Works.

Forwarded.

(By Order.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

IRRIGATION.
ACCOUNT.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated November, 7th.

Recd. *Encl.*

G.O., 7th Nov. 1894, Nos. 856, 857 I.

NOVEMBER.

Rest-house and out-houses at Puthukudi

Forwarding copy of Proceedings sanctioning, with remarks, the revised estimate of Rs. 3,5 80 for constructing a —, Srívaikuntam anicut system.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

Read—the following paper :—

From Major W. L. C. BADDELEY, R.E., Superintending Engineer, II Circle, to the Chief Engineer for Irrigation, dated Bezwada, 22nd September 1894, No. 1411 K.S.

I have the honour to forward herewith, for your approval and sanction of Government, an estimate, amounting to Rs. 6,900, for extending Ponukumad main channel of Ellore canal in the Kistna Eastern division, and to request that you will be so good as to sanction it from the balance available for unforeseen works of the Kistna delta system.

2. An estimate, amounting to Rs. 5,930, was sanctioned for the main channel in G.O., No. 2 I., dated 11th January 1892, for irrigating 1,797 acres and was worked out. As the extent of irrigation is increased to 4,550 acres, the extension now proposed appears necessary as explained in the report accompanying.

Enclosure.

Report to accompany the estimate for extending Ponukumad main channel amounting to Rs. 6,900.

The Ponukumad main channel at present terminates at 2 miles 2 furlongs 330 feet in an old channel belonging to the Avatapally sluice which was closed after the construction of Ponukumad head sluice.

2. This old channel, which extends to Ponukumad village, has been realigned and extended in such a direction as not to interfere with the present cattle paths (donkas) and so as to command the land intended to be supplied. The survey and sections show particulars as to the course, &c.

3. The present extent of irrigation is 1,797 acres and the proposed extension is 2,753, making in all 4,550 against 1,020 originally proposed to be irrigated. The details of areas to be irrigated are given on the survey.

4. The bed and surface falls have been designed to suit the land to be commanded. The bed widths and discharges have been calculated according to the revised water duty, *i.e.*, 90 acres per one cubic foot.

5. Two drops have been provided for where necessary and also two cattle crossings in suitable places to ensure the safety of the channel banks.

6. A necessary tail escape also provided. Detail plans and estimates of the masonry works above referred to are herewith forwarded. An early sanction is requested so that the work may be put in hand by the commencement of the ensuing working season.

(Signed) R. N. H. REID,
Asst. Engr., Kistna Eastern Division.

ESTIMATE FORM—Abstract—Classified.

Sub-head.	Names of works.	Amount of estimate for individual work.	Total of sub-heads.	Total for each canal or distributary.	Total of each main head.
1	2	3	4	5	6
		RS.	RS.	RS.	RS.
	CAPITAL EXPENDITURE NOT CHARGED TO REVENUE.				
	49. *Irrigation.*				
	Kistna Delta System.				
	Eastern Section.				
	I. Works.				
	3. Distributaries.				
	Ellore Canal.				
2. Land	1. Compensation for land	2,548	2,548		
3. Works	2. Drop No. 3 at 2 miles 6 furlongs ..	320			
	3. Do. ,, 4 at 4 ,, 3 ,, ..	300			
	4. Cattle crossing at 3 miles 2 furlongs..	155			
	5. Do. at 4 ,, 3 ,, ..	165			
	6. Tail escape at end	190	1,130		
4. Earthwork ..	7. Earthwork	2,832			
	8. Earthenware pipes	230	3,062		
5. Miscellaneous ..	9. Demarcation stones	80	80	6,820	6,820

(Signed) W. L. C. BADDELEY, Major, R.E.,
Superintending Engineer, II Circle.

No. 116 I.

Submitted to Government. The amount of the estimate has been reduced in this office from Rs. 6,900 to Rs. 6,820, the reduction being due to the rate for demarcation stones being altered from Rs. 3 to Rs. 1½.

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Chief Engineer for Irrigation.

12th Oct. 1894.

ORDER—dated 7th November 1894, No. 858 I., Public Works.

The estimate, amounting to Rs. 6,820, for extending the Ponukumad channel, a distributary of the Ellore canal, Kistna delta system, Eastern section, is sanctioned from the balance of amount reserved for unforeseen works of the Kistna delta system, which will then be reduced to Rs. 93,950.

2. This sanction is registered as No. 110 I. of 1894–95.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
,, Superintending Engineer, II Circle, with one enclosure.
,, Examiner, Public Works Accounts.
,, Revenue Department.

IRRIGATION.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated November, 7th.

Recd. *Encl.*

G.O., 7th Nov. 1894, No. 858 I.

NOVEMBER.

Ponukumad Channel

Estimate of Rs. 6,820 for extending the —, a distributary of the Ellore canal, Kistna Eastern delta, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following paper :—

No. 128 I.

Note by the Chief Engineer for Irrigation.

The preparation of histories of important engineering works which have been successfully carried out in this Presidency has been under contemplation for many years. Narratives of several of the irrigation systems, both major and minor, have from time to time been written, but these are chiefly useful in a financial point of view and do not deal with the engineering details which would be useful to engineers. Owing to want of the services of a special officer for carrying on the work of compiling the histories effectively, no progress has hitherto been made with the work beyond the collection of some plans considered necessary for the purpose. As it is very desirable that a commencement should be made with the work, it is intended to begin with the Buckingham canal. To illustrate the note on the history, present condition and utility of this canal, Mr. Russell, the present Executive Engineer of the Canal division, requests that an allowance of Rs. 200 may be made for the following photographs :—

(1) Madras wharf.
(2) Pennér north lock.
(3) Kottapatam wharf and iron girder bridge.
(4) Inlet in 143rd mile.
(5) 10-vent outlet.
(6) Flood gate.
(7) Lock under construction.
(8) Canal reach about 65th mile.
(9) Ennore bar, backwater and Public Works bungalow.

It is recommended that this expenditure may be authorized. The views will be reproduced from the negatives by the Survey Department by the blue process and appended to copies of the history for circulation.

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Chief Engineer for Irrigation.

1st Nov. 1894.

ORDER—dated 8th November 1894, No. 859 I., Public Works.

The Government authorizes the expenditure of Rs. 200 in obtaining photographs required for illustrating the history of the Buckingham canal to be prepared by Mr. A. S. Russell.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, II Circle.
" Executive Engineer, Buckingham Canal Division.
" Examiner, Public Works Accounts.
" Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1894} Madras.

PUBLIC WORKS.

I ated November, 8th.

Recd. *Encl.*

G.O., 8th Nov. 1894, No. 859 I.

NOVEMBER.

Expenditure

Authorising the — of Rs. 200 in obtaining photographs required for illustrating the history of the Buckingham canal.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following papers :—

From the Collector of Bellary, dated 13th September 1894, No. 4539.

Proceedings of the Board of Revenue (Revenue Settlement, Land Records and Agriculture), dated 29th October 1894, Mis. No. 6599.

Read—the following letter from Colonel R. R. E. DRAKE-BROCKMAN, R.E., Chief Engineer for Irrigation, to the Secretary to the Board of Revenue (Revenue Settlement, Land Records and Agriculture), dated 24th October 1894, No. 563 M. :—

With reference to Board's Proceedings, Mis. No. 4404, dated 24th July 1894, I have the honour to forward herewith an estimate, amounting to Rs. 910, for repairing the Talavagal tank in the Bellary district. The amount of the estimate has been reduced in this office from Rs. 1,160 to Rs. 910. The rate provided for earthwork is excessive and has been reduced from Rs. 6–15–0 to Rs. 4–7–0 per 1,000 cubic feet.

2. On receipt of the sanction of the Board to the execution of the work, the amount required for expenditure on it during the current year will be allotted from the special grant placed at the disposal of this department for expenditure by Public Works Department officers on "Minor Works, Revenue Department."

Resolution—dated 29th October 1894, Mis. No. 6599.

The execution of the work during the current year is sanctioned.

(True Copy and Extract.)

(Signed) P. RAJARATNA MUDALIAR,
Secretary.

No. 130 I.

Submitted to Government for the provision of the requisite funds for the execution of the work during the current year.

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Chief Engineer for Irrigation.

5th Nov. 1894.

Order—dated 8th November 1894, No. 860 I., Public Works.

The following transfers of funds are sanctioned :—

Irrigation.
43. Minor Works and Navigation.
Minor Works, Revenue Department.

From		RS.	*To*		RS.
Reserve—			Bellary division—		
Original Works	... ...	910	Repairs	.. ..	910
Establishment	... ...	209	Establishment	... ...	209
Tools and Plant	... ...	14	Tools and Plant	... ...	14
	Total ...	1,133		Total ...	1,133

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
,, Superintending Engineer, III Circle, with six enclosures.
,, Examiner, Public Works Accounts.
,, Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated November, 8th.

Recd. *Encl.*

G.O., 8th Nov. 1894, No. 860 I.

NOVEMBER.

Funds

Certain transfers of — in the Bellary division, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following paper :—

No. 126 I.

Note by the Chief Engineer for Irrigation to accompany the estimates for repairs and improvements to Thorapadi tank and to Virupatchipuram (ruined) tank surplus channel.

About three miles to the south of Vellore Fort in the limits of Virupatchipuram village there is a ruined tank formed by a bund thrown across a hill stream and connected at either flank with the adjoining hills. At the east end of the tank is a small calingulah from which, before the tank breached, surplus used to flow into the cusba nullah. During the cyclone of 1872 the tank, with several others situated above the town of Vellore, breached and many lives were sacrificed and much damage done in the flooded part of the town.

2. After considerable correspondence it was decided in G.O., dated 20th June 1873, No. 1612, Public Works, that the ruined tanks should not be restored though, as was pointed out by the Chief Engineer for Irrigation, whether the tanks were restored or not and though the greater part of the town is on well-raised ground not liable to suffer from the breaching of any tanks in the neighbourhood, yet the cusba and the ground then occupied by the family lines near the Roman Catholic church are so low that they will always be subject to inundation which would however not be attended with such disastrous consequences as must result from a considerable body of water being poured from breached tanks as was the case in 1872. He further pointed out that the lines of the 14th Regiment were situated in a most dangerous locality on ground which is the natural and direct line of outfall for a flood. It is on this spot that the new Vellore railway station has been constructed.

3. The question of the restoration of Virupatchipuram having been disposed of, an estimate was sanctioned in G.O., No. 1427, Public Works, dated 29th May 1874, for protecting the town of Vellore from floods by diverting the whole of the water from the hill stream which now flows through the breach in Virupatchipuram ruined tank into Thorapadi tank. This estimate, as originally submitted by Captain (now Colonel) Pennycuick, R.E., provided for a channel 40 feet wide and capable of carrying a maximum depth of water of 5 feet, the discharge being estimated at 3,227 cubic feet per second. The Chief Engineer for Irrigation characterized this estimate of the probable flood discharge as needlessly extravagant and reduced it to 1,642 cubic feet per second thereby reducing the bottom width of the proposed diversion channel to 20 feet.

4. Since the completion of this smaller scheme, the inadequacy of the channel has been repeatedly shown by periodical breaches and it is now considered that the original estimate of the maximum flood discharge of 3,227 cubic feet per second is probably not excessive.

5. The present estimate therefore practically provides for carrying out Captain (now Colonel) Pennycuick's original proposals though these proposals have not been rigidly adhered to. The diversion of surplus water from the cusba nullah has, as has already been pointed out been made more necessary than ever as, though the family lines of the Native Regiment have been removed, the South Indian Railway have availed themselves of the vacated site for the Vellore station, and this station has already (*vide* G.O., dated 17th November 1891, No. 2752 R.) been damaged by floods.

6. In dealing with this subject it is necessary to point out that two distinct interests are involved—

(1) The protection of the town of Vellore from floods.

(2) The irrigation under the Virupatchipuram channel and under Thorapadi tank.

7. So far as irrigation is concerned, the Virupatchipuram channel is, in its present state, a most efficient spring channel which irrigates 210 acres bringing in a revenue of Rs. 1,214. The line of the channel is said to be the course of a spring channel which existed before the Virupatchipuram tank breached and its diversion into Thorapadi has simply resulted in large quantities of sand being carried into that tank. This excessive silting is, however, from an irrigation point of view, the only defect in the original scheme carried out in 1874, and it seems evident that the restoration of Virupatchipuram tank would now be an absolute mistake seeing that all the lands previously irrigated by this and Allapuram ruined tank are effectively irrigated from the channel. The only improvement necessary therefore from an irrigation point of view is to exclude silt from Thorapadi tank while at the same time allowing the villagers to divert as much water as they like from the Virupatchipuram channel to their tank. This, in the present estimate, has been provided for by bunding off a small portion of Thorapadi tank bed and demolishing the body wall of the existing weir. This proposal will not appreciably reduce the capacity of Thorapadi tank, nor will it reduce its supply of water for irrigation, nor alter the existing disposal of flood water except that Virupatchipuram channel water will during floods be excluded from the tank. If the Thorapadi villagers wish to divert water from the Virupatchipuram channel to this tank, they can easily do so through the vents in the proposed weir in the cross bund.

8. The above indicates all the work required to be done from an irrigation point of view, but would have but little effect in protecting the town of Vellore from floods. For this purpose it is proposed to widen and embank the Virupatchipuram channel so as to carry a maximum flood of about 3,000 cubic feet per second to increase the water-way of the bridges under the Arni and Jail roads. As the floors of these bridges are on a low level, drops will be constructed immediately above each bridge in order to prevent, if possible, the excessive silting which now takes place. The improvements to the channel being solely required in the interests of the Railway and of the town of Vellore, it is suggested that the cost should be met from other than irrigation funds.

Details of the work proposed to be done will be found in the reports which accompany the estimates.

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Chief Engineer for Irrigation.

17th Oct. 1894.

To the Joint Secretary to Government,
Public Works Department, Irrigation Branch.

Enclosures.

Report to accompany the estimate for repairing No. 1 Thorapadi tank.

Source of supply.—The tank, in addition to a supply from the Pálár river through No. 1 Sedupperi tank and the drainage from its free catchment basin of 3·40 square miles, receives the surplus of eighteen uplying tanks having in all a combined catchment area of 23·00 square miles,

the calculated flood discharge from which (C = 550 and C = 110) amounts to 3,650 cubic feet per second. The tank also at present receives a large supply from a channel from the Virupatchipuram ruined tank which enters at the right flank.

In 1872 the town of Vellore was flooded by the breaching of Virupatchipuram and two tanks below it, and it was ordered in G.O., No. 1612 W., dated 20th June 1873, that these tanks should not be restored, and, with a view to effectually protect the town of Vellore from future floods, the channel from the breach in Virupatchipuram tank was diverted into Thorapadi tank. The result has not been satisfactory as, owing to the large quantity of silt deposited in the tank, the villagers complain that the capacity is rapidly being diminished without any compensating advantage, as the tank obtains a good supply from other sources. Consequently it is now proposed to cut off the portion of the tank bed by a cross bund along the line A B in the sketch map and to allow the discharge from the channel to pass over the existing large weir at the right flank of the tank. This arrangement will in no way be prejudicial to the supply of water to lands under the tank, as by forming a small bund water can be diverted into the tank through the vents provided in the proposed weir in the cross bund, or, if this is not required, can be allowed to flow over the existing weir modified (as stated below) to irrigate directly lands now supplied from the tank.

Surplus arrangements.—The tank has two masonry weirs, 55½ feet and 254½ feet long, respectively, which are adequate to dispose of the whole surplus of the tank, but as the large weir will be cut off by the proposed cross bund (to prevent the drainage of the channel from Virupatchipuram ruined tank entering this tank), it is proposed to provide a masonry weir 222 feet long (with two vents each 3 feet × 2½ feet at the left end) as per plan in the cross bund to discharge 2920 cubic feet per second, the remaining surplus being disposed of over the existing small weir near the centre of the bund. The crest of the small weir being about 6 inches above F.T.L will be reduced accordingly. The body wall of the existing large weir will be removed to the level of the apron to allow free flow of water from both the channel and tank.

Sluices.—There are six masonry sluices in the tank, which are all in need of repair. Sluices Nos. 1 and 2 from the left flank will be repaired and improved as per plans accompanying. The front cistern of sluice No. 3 will be rebuilt or raised as may be required. Owing to water in the tank it is impossible to say what repairs are required for sluice No. 4, so a lump sum of Rs. 75 is provided for either repairing or rebuilding the front cistern and providing gibbet stones. The walls of the front and rear cisterns of sluices Nos. 5 and 6 will be raised to the existing bed level of the tank as they are now liable to be choked with silt.

Bund.—The bund is in fair order except in places. It will, however, be raised to 4 feet above M.W.L., with 5 top width from cross section 15 to the right flank where it meets the railway embankment, and the rest to 3 feet above M.W.L. with 4 feet top width and slopes 1½ to 1 throughout.

Proposed cross bund.—The proposed cross bund on line A B will be raised to 3 feet above M.W.L. with 5 feet top width and slopes 1½ to 1.

Revetment.—The front slope of the tank bund is revetted throughout. The revetment is in fair order, but below M.W.L. in places. It will be raised to 1 foot above M.W.L. throughout. The proposed cross bund will also be revetted to 1 foot above M.W.L. in front and to + 717·08 in rear at a slope of 1 to 1 with 6″ gravel backing.

REPORT to accompany the estimates for improving and embanking Virupatchipuram (ruined) tank surplus channel.

This estimate provides for carrying out the original proposals made by Captain (now Colonel) Pennycuick, R.E., in 1874 for the protection of the town of Vellore from floods by diverting all the water which flows through the breach in the Virupatchipuram ruined tank into the Pálár river over the existing weir at the east end of Thorapadi tank.

In the general note which accompanies this estimate it has been explained that Captain (now Colonel) Pennycuick's original estimate of the probable flood discharge was cut down by the Chief Engineer for Irrigation and the diversion channel considerably reduced in section. The result has been most unsatisfactory, as, owing to insufficient section of the channel and to the reduced water-way of the bridges on the Arni and Jail roads, the bank of the channel has frequently breached and Vellore has been more or less flooded whenever there was heavy rain.

Many proposals have been made from time to time for dealing with this question including the complete and partial restoration of Virupatchipuram tank, but it has been considered advisable to adhere more or less closely to Captain (now Colonel) Pennycuick's original proposals, as by doing so the irrigation under the channel, which has, since 1874, increased considerably, will not be interfered with. Any idea of constructing a dam in the breach in Virupatchipuram tank has therefore been abandoned, partly in order to avoid interference with the irrigation of 110 acres now supplied by channels on each side of the breach, but chiefly because the channel through the tank bed has now scoured down to rock and there is but little chance of any large quantity of silt being brought down during floods from above the breach.

2. The present estimate therefore provides for embanking, widening and deepening the channel where necessary, as shown on the plans, and for the necessary masonry works.

3. The catchment area of the hill stream above Virupatchipuram tank is about 5 square miles, and, considering that the whole basin consists of rocky hills, it is considered that a co-efficient of 1,000 in the formula C.M.$^{\frac{2}{3}}$ is not too high. The resulting discharge is about 3,000 cubic feet per second which nearly agrees with the discharge originally estimated by Captain (now Colonel) Pennycuick.

4. To discharge this quantity the channel is proposed to be widened where necessary to the dimensions shown in statement A. The channel up to 3,950 feet is of very irregular section, and the probable maximum depth of water will vary from section to section, but the depths shown in the statement and on the plans are believed to be approximately correct.

5. The flood bank will be on the right side of the channel and will be 3′ 0″ above the calculated M.W.L., with 6′ 0″ top width and side slopes 1½ to 1. From the breach in Virupatchipuram tank bund for a distance of about 1,400 feet, the ground is high and no bank is required, and from 2,000 to 3,050 feet there is an existing bank which has been formed by the villagers from silt brought down by floods. This latter length will be revetted at a slope of 1¼ to 1 to one foot above M.W.L.

From 4,400 to 5,800 feet the bank of Allapuram ruined tank, which was finally abandoned in 1873, forms the channel bank. The abandoned tank weir and breach in this length will be closed, and the drainage received from the catchment basin of the ruined tank will be allowed to escape as usual through existing breaches in the length of tank bund beyond where it forms the channel bank. These breaches will, however, be extended or additional breaches made, the earth being utilized to make up the length of bank proposed to be retained or for the channel bank. Elsewhere, up to where the channel crosses the Arni road, the bank will be formed on putta land for which compensation will have to be paid. For taking earth to form the bank no provision for compensation has been made in the estimate, as it is believed that the ryots will offer no opposition to their fields being lowered.

6. Below the Arni road the existing bank will be raised and strengthened, earth being thrown on the rear side as the existing front slope is in places well covered with turf

7. Owing to the low level of the floors of the existing bridges which carry the Arni and Vellore roads, it has been considered necessary to deepen the channel at these places to floor level. To do this and prevent the accumulation of silt in future, a drop is proposed to be constructed above each bridge and to enable the bridges to discharge a maximum flood the waterway at each is proposed to be increased by an additional span.

8. Both slopes of the bank will be protected with coracai grass planted thickly.

9. The channel bank with a margin of 6 feet will be demarcated, also the left margin of the channel, to prevent encroachments.

CLASSIFIED abstract estimate for repairing and improving Thorapadi tank and surplus channel from Virupatchipuram ruined tank.

—	Name of work.	Original works. Amount.	Original works. Total.	Repairs. Amount.	Repairs. Total.	Total amount estimated.
	Thorapadi Channel.	RS.	RS.	RS.	RS.	RS.
1	Constructing a masonry drop No. 1 at 6,650 feet below head or 50 feet above Arni road culvert	1,970				
2	Constructing a masonry drop No. 2 at 11,750 feet below head or 50 feet above the culvert across the Jail road ..	1,600				
3	Providing an additional vent to the culvert across the Arni road at 6,700 feet below head	900				
4	Providing an additional vent to the culvert across the Jail road at 11,800 feet below head	1,200				
5	Constructing 5 stoneware pipe sluices	270				
6	Fixing demarcation stones along the margin of the channel banks	100				
	Compensation for land to be taken up for bank ..	2,056	8,096			
7	Clearing silt and raising and strengthening the right flood bank of the channel.	..	..	5,460	5,460	
		..	8,096	..	5,460	13,556
8	Add repairs already carried out and expenditure incurred as per G O., No. 604 I., dated 22nd August 1894 ..	..	..	..	..	2,944
	Total for the channel ..	..	..	..	..	16,500

Classified abstract estimate for repairing and improving Thorapadi tank, &c.—*cont.*

—	Name of work.	Orignal works. Amount.	Orignal works. Total.	Repairs. Amount.	Repairs. Total.	Total amount estimated.
	Thorapadi Tank.	RS.	RS.	RS.	RS.	RS.
9	Forming a cross bund on line A.B. connecting South India Railway embankment and tank bund to prevent floods in the surplus channel of Virupatchipuram ruined tank entering the Thorapadi tank	715				
10	Constructing a weir in the cross bund	1,260	1,975			
11	Raising and strengthening the tank bund	..	..	630		
12	Repairing existing weirs	..	..	125		
13	Do. sluices	..	..	370	1,125	
	Total for tank ..	..	1,975	..	1,125	3,100
	Grand Total ..	..	..	..	..	19,600

ORDER—dated 8th November 1894, No. 861 I., Public Works.

The estimates for the repair of Thorapadi tank, items 9 to 13 in the classified abstract estimate, are sanctioned.

2. The estimates, items 1 to 8 in the classified abstract, will be transferred to the Chief Engineer, Public Works Department, for disposal with special reference to paragraphs 2, 6, 7 and 8 of the note by the Chief Engineer for Irrigation and to G.O., No. 937 I., dated 4th November 1893.

This sanction is registered as No. 112 I. of 1894–95 and classified as shown below :—

Irrigation.
43. Minor Works and Navigation.
Minor Works for which neither Capital nor Revenue Accounts are kept, P.W.D.
Tank Restoration Works.
North Arcot Division.
Thorapadi Tank.

	RS.
Original Works	1,975
Repairs	1,125
Total ...	3,100

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer, Public Works Department,
with plans and estimates.
" Consulting Engineer for Railways.
" Superintending Engineer, IV Circle.
" Chief Engineer for Irrigation.
" Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated November, 8th.

Recd. *Encl.*

G.O., 8th Nov. 1894, No. 861 I.

NOVEMBER.

Thorapadi Tank

Estimates for the repair of — in North Arcot division, sanctioned, and those for the repair of Thorapadi channel, transferred to the Chief Engineer, Public Works Department, for disposal.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

Read—the following papers :—

Proceedings of the Board of Revenue (Revenue Settlement, Land Records and Agriculture), dated 30th August 1894, No. 353, Press.

Read—report on the condition of tanks affecting railway lines during 1893–94 submitted by certain Collectors.

Resolution—dated 30th August 1894, No. 353, Press.

The Board resolves to submit to Government, with reference to G.O., dated 23rd January 1894, No. 271, Revenue, a statement showing the condition of the tanks in charge of the Revenue Department which affect the railway lines in each district during 1893–94.

2. The necessary information for the compilation of this statement was not furnished by all the Collectors within the prescribed date and the delay is reported to have been due to the difficulty in obtaining correct lists of the railway-affecting tanks, this being the first attempt made by the Revenue Department to collect information on that point. All Collectors are requested to see that future reports are submitted punctually.

3. Excluding the Cuddapah sub-division, for which returns have not yet been received, there are 2,624 tanks affecting railway lines, of which 1,499 are Government and 1,125 private. Of these, 790 were in good order at the beginning of the year under report, 203 were repaired during the year, and 1,631 were in need of repairs. The steps reported to have been taken for putting the tanks in the last-mentioned class in good order are noted in the last column of the statement.

4. The Collectors of the marginally-noted districts have not reported the measures adopted in respect of all the tanks that are stated to be in need of repairs. The Collector of Nellore does not appear to have taken any action in respect of the private tanks in his district which threaten railways. He should lose no time in taking the necessary steps under Act IV of 1886.

Nellore.	Trichinopoly.
Anantapur.	Madura.
South Arcot.	

5. The Collector of South Arcot does not propose repairs to some of the tanks which are not in good order, because it is said the ryots did not complain of want of water or because there is no urgency in the matter. If the tanks in question are really out of order, it is essential to the safety of the railway that they should be repaired without delay even though the danger may not be imminent. The Collector should also make the necessary arrangements with the Forest Department for the

repair of the tank stated to be in charge of that department. This tank should have been shown in the statement as a Government tank and not as a private one. It should also be explained why the tank is in charge of that department. If it is included in any of the forest reserves, the control of the work must still lie with the Revenue Department.

6. In the case of the tanks stated to have been abandoned, it is presumed that they will not hold water or endanger the safety of railway lines.

7. The total number of tanks affecting railways in the North Arcot and Trichinopoly districts, as now reported, does not tally with that given by the Public Works Department in the papers communicated with Board's Proceedings, dated 28th November 1893, No. 6751, and 9th January 1894, No. 66. The Collectors of the two districts are requested to have further inquiries made regarding the accuracy of the figures.

(True Extract.)

(Signed) P. RAJARATNA MUDALIAR,
Secretary.

Districts.	Minor tanks under Revenue Department			Private, zemindari, &c., tanks.			Total.					
	In good order.			In good order.			In good order.			Total.		
	Repaired up to the year.	Repaired in the year.	In need of repair.	Repaired up to the year.	Repaired in the year.	In need of repair.	Repaired up to the year.	Repaired in the year.	In need of repair.	Government.	Private.	Total.	Remarks explaining fully the condition of tanks in need of repair and why they have not been taken up for repair.
1. Ganjám	12	44	527	80	..	242	92	44	769	583	322	905	Six hundred and eighty-seven are in Berhampur and 82 in Chicacole; estimates are being received for Government works and works being taken up for repair.
2. Vizagapatam ..	3	1	..	2	2	12	5	3	12	4	16	20	Nine, estimates called for from Public Works Department; two will be repaired soon by owners; one, Public Works Department requested to repair, owner has paid cost.
3. Gódávari	62	4	37	4	7	13	66	11	50	103	24	127	Seven will be repaired this year and three next year; two, estimates called for; four, private tanks, enquiries being made. No explanation received from Head Assistant Collector regarding 34 tanks.
4. Kistna	..	12	30	64	..	140	64	12	170	42	204	246	Thirty Government tanks under repair by Tank Restoration Scheme Party; estimates for 20 private tanks are ready and action will be taken under Act IV of 1886; estimates for 120 private tanks will be prepared after the issue of necessary orders by Government—*vide* Board's Proceedings, dated 10th August 1894, No. 4856.
5. Nellore	15	4	12	15	3	40	30	7	52	31	58	89	Four, estimates under preparation; three will be repaired this year; seven will be repaired soon; 36 are neglected by the owners.
6. Cuddapah	15	1	11	2	..	6	17	1	17	27	8	35	The return for sub-division not received; two under repairs; nine, estimates called for; three breached long ago and cannot hold water; one, no ayakut, proposal for abandonment called for; one, Public Works Department will be consulted for repair; one, notice served on owner.
7. Anantapur	25	2	18	13	..	3	38	2	21	45	16	61	One since repaired; one made over to Public Works Department; three abandoned and included in the list of famine relief works; five, steps being taken to have repaired.
8. Bellary	8	..	..	3	1	..	11	1	..	8	4	12	
9. Kurnool	3	1	1	..	..	..	3	1	1	5	..	5	The tank in need of repair is the one referred to in Board's Proceedings, dated 25th June 1894, No. 252, as not worth restoring.
10. Madras	3	2	..	..	..	..	3	2	..	5	..	5	
11. Chingleput ..	14	..	1	5	..	10	19	..	11	15	15	30	One under repair; six, notice given to owners; four, steps will be taken for repairs.
12. North Arcot ..	55	2	82	24	5	55	79	7	137	139	84	223	Estimates for repair of Government tanks have been called for. Notices have been served on owners of private tanks and steps are being taken for their repair.
13. South Arcot ..	117	4	20	4	..	1	121	4	21	141	5	146	Two will be repaired this year; ten in charge of Tank Restoration Scheme Party; eight not in urgent need of repair.
14. Tanjore	6	2	1	..	..	..	6	2	1	9	..	9	One will be repaired this year.
15. Trichinopoly ..	18	22	45	32	16	51	50	38	96	85	99	184	Seven will be repaired this year; seventeen, estimates ready; three, estimates ordered; sixteen petty tanks will be repaired by kudimaramat; two breached long ago have no ayakut and are not worth restoring; twenty-eight, notices issued to owners; ten, notices will soon be issued; two under repair.
16. Madura	28	56	78	22	..	69	50	56	147	162	91	253	Four under Tank Restoration Scheme Party; eight will be repaired this year; two will be repaired next year; two since reported to be in good order; 35, estimates called for; 29 recommended to be assigned on special rates; one abandoned; two, situation not known, Public Works Department has been addressed; sixty-one, notices served on owners; further steps will be taken in due course.
17. Tinnevelly ..	43	5	13	39	4	35	82	9	48	61	78	139	Five will be repaired this year; three will be repaired next year; two under Tank Restoration Scheme Party; four abandoned; two ruined; three will not cause danger to the railway line; twelve, estimates under preparation; fifteen, notices issued to owners; further steps will be taken in due course; one, situation not known, Public Works Department will be addressed; one in fairly good order.
18. Coimbatore ..	5	..	1	..	..	..	5	..	1	6	..	6	One will be repaired this year.
19. Salem	16	..	7	30	2	69	46	2	76	23	101	124	Two will be repaired this year; twelve, notices issued to owners; further enquiries being made as regards the rest.
Total ..	451	163	885	339	40	746	790	203	1,631	1,499	1,125	2,624	

Mis. No. 3474, Revenue.

Transferred to the Public Works Department.

Ootacamund,
5th September 1894.

(Signed) E. GIBSON,
Ag. Secretary to Government.

No. 114 I.

Note by the Chief Engineer for Irrigation.

With its Proceedings No. 353, Press. dated 30th August 1894, the Board of Revenue submitted a statement showing the condition of the railway-affecting tanks under the Revenue Department including zemindari and private tanks in each district for 1893–94 as called for in paragraph 2 of G.O., Mis. No. 271, Revenue, dated 23rd January 1894. The total number of such tanks is shown to be 2,619, while the statements received from the Superintending Engineers show 3,294 tanks, of which 986 are reported to be in good order, 1,015 inspected and their condition reported and 1,293 have yet to be inspected. The numbers of tanks in each district are shown below :—

—	Board's statement.			Superintending Engineers' statements.					
	Revenue Department.	Private and zemindari.	Total.	Revenue Department.	Private and zemindari.	Total.	In good order.	Inspected.	Not yet inspected.
Ganjám ..	583	322	905	52	117	169	..	..	169
Vizagapatam	4	16	20	16	170	186	45	48	93
Gódávari	103	24	127	152	301	453	172	276	5
Kistna ..	42	204	246	43	204	247	63	183	1
Nellore ..	31	58	89	10	29	39	10	29	..
Cuddapah	27	8	35	285	248	533	57	..	476
Kurnool ..	5	..	5	46	3	49	48	..	1
Bellary ..	8	4	12	7	4	11	10	..	1
Anantapur	45	16	61	9	2	11	11	..	..
Madras ..	5	..	5	..	..	..	..	..	..
Chingleput	15	15	30	22	49	71	15	1	55
Tanjore ..	9	..	9	167	6	173	..	6	167
South Arcot	141	5	146	150	9	159	103	18	38
North Arcot	139	84	223	242	159	401	145	..	256
Salem ..	23	101	124	..	131	131	77	23	31
Coimbatore	6	..	6	..	..	..	..	..	..
Trichinopoly	85	99	184	96	94	190	48	142	..
Madura ..	162	91	253	229	96	325	129	196	..
Tinnevelly	61	78	139	81	65	146	53	93	..
Total ..	1,494	1,125	2,619	1,607	1,687	3,294	986	1,015	1,293

The variations between the Board's and Superintending Engineers' statements are large and require explanation.

2. The necessity for the Public Works Department preparing plans and estimates for repairing the zemindari and private tanks affecting railways is now under consideration by the Chief Engineer, Public Works Department, and the settlement of the question is awaited before taking any action in this department towards the preparation of plans and estimates for repairing such tanks.

3. The condition of tanks affecting railways under the charge of this department is as shown below :—

Divisions.	In good order.	Repaired.	Estimates prepared.	Requiring attention.	Total.
Ganjám	9	3	3	10	25
Vizagapatam	..	..	..	..	..
Gódávari	51	1	3	115	170
Kistna	1	..	2	..	3
Nellore	8	..	..	12	20
Cuddapah	16	2	2	4	24
Kurnool	17	..	1	..	18
Bellary	20	..	1	..	21
Chingleput	118	3	51	69	241
Tanjore	2	..	..	4	6
South Arcot	23	1	8	..	32
North Arcot	47	17	8	25	97
Salem	13	7	..	..	20
Coimbatore	14	3	3	..	20
Trichinopoly	10	1	4	2	17
Madura	29	7	4	15	55
Tinnevelly	4	..	1	1	6
Total ..	382	45	91	257	775

4. The lists and maps of all tanks affecting railway in the North Arcot district are now being printed for general circulation and similar lists and maps for the other districts will be prepared in due course.

Madras, (Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
10th Oct. 1894. Chief Engineer for Irrigation.

To the Joint Secretary to Government,
Public Works Department, Irrigation Branch.

Order—dated 8th November 1894, No. 862 I., Public Works.

Superintending Engineers will ascertain, in communication with the Collectors concerned, the cause of the discrepancies in the statements submitted by them and the Collectors. Whatever may be the actual figures eventually ascertained to be correct, it is evident that there are a large number of tanks affecting railways in an unsatisfactory condition, and, considering the great danger to the public and possible loss of large sums of money which may accrue in consequence of their being left without attention, it is most important that this matter should receive the most careful consideration by the Irrigation and other departments concerned.

2. Early steps will be taken in the Public Works and Revenue Departments to put all railway-affecting tanks under their charge in order. As regards zemindari and private tanks, Collectors will, pending the settlement of the question whether plans and estimates for repairing them should be prepared by the Public Works Department or not, take the preliminary steps necessary for inducing the owners to repair their tanks.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer, Public Works Department.
" the Chief Engineer for Irrigation.
" all Superintending Engineers.
" the Revenue Department.
" the Consulting Engineer for Railways.

IRRIGATION.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated November, 8th.

Recd. *Encl.*

G.O., 8th Nov. 1894, No. 862 I.

NOVEMBER.

Tanks affecting Railways

Orders directing Superintending Engineers to ascertain the cause of the discrepancies in the statements of — submitted by them and the Collectors, and the Public Works and Revenue Departments to take early steps to put all railway-affecting tanks under their charge in order.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

Read—the following paper :—

From J. P. Davidson, Esq., Officiating Superintending Engineer, V Circle, to the Chief Engineer for Irrigation, dated Chepâk, 17th October 1894, No. 374 E.I.

I have the honour to submit for sanction the enclosed estimate of Rs. 810, with accompaniments as per margin, for constructing lascars' sheds at Jamboocauvery head.

1 Abstract estimate.
1 Site plan.
1 Plan of shed.
1 Report.

2. The necessity for the work is explained in the report accompanying the estimate.

Enclosure.

Report to accompany the estimate for constructing lascars' sheds at Jamboocauvery head.

	RS.
Amount of estimate	810

Jamboocauvery is an offtake of Vennar. The lascars employed at its head have no huts to live in, but they were some time back lodged in temporary huts which are now in ruins. As it is indispensably necessary that these men should live close by their charge, provision is made in the accompanying estimate for three huts to be built after the model of those built at Cauvery Vennar regulators.

Work will be done according to standard specification.

(Signed) J. C. Johnston,
Executive Engineer, Tanjore Division.

20th September 1894.

Order—dated 10th November 1894, No. 865 I., Public Works.

The following estimate is sanctioned :—

Irrigation.
42. Major Works (Working Expenses).
Cauvery Delta System.
Extensions and Improvements.
3. Distributaries.
5. Miscellaneous.

	RS.
Constructing lascars' sheds at Jamboocauvery head, estimate	810

2. This sanction is registered as No. 114 I. of 1894–95.

(True Extract.)

(Signed) R. R. E. Drake-Brockman, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation
" Superintending Engineer, V Circle, with five enclosures.
" Examiner, Public Works Accounts.
" Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated November, 10th.

Recd. *Encl.*

G.O., 10th Nov. 1894, No. 865 I.

NOVEMBER.

Lascars' Sheds

Estimate of Rs. 810 for constructing — at Jamboocauvery head, Cauvery delta system, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

Read—the following paper :—

Application for modification of existing grants under irrigation for the year 1894–95, V Circle.

Item No.	Division.	Works.	Amount of estimate.	Existing grant.	Modifications applied for.		Modifications proposed.		Revised grant.	Remarks.
					Decrease.	Increase.	Decrease.	Increase.		
		43. Minor Works and Navigation.								
		Works for which Capital and Revenue Accounts are kept.								
		Revenue.								
		Extensions and Improvements.								
		Madras Water Works and Irrigation Extension Project.								
1	Chingleput ..	Minor original works ..	310	..	..	310	..	310	310	Urgently required for constructing measuring weirs in rear of sluices of Red Hills tank—Irrigation Chief Engineer's memo. No. V/41-C.N., dated 16th August 1894, paragraph 6. Work has been ordered to be gone with in anticipation of allotment of funds.

No. 398 E.I.

Submitted to the Chief Engineer for Irrigation with request that he will be so good as to obtain sanction to the modification of grants herein applied for.

Chepâk,
2nd November 1894.

(Signed) J. C. LARMINIE,
Superintending Engineer, V Circle.

Order—dated 10th November 1894, No. 866 I., Public Works.

The following transfers of funds are sanctioned :—

Irrigation.
43. Minor Works and Navigation.

From

Minor Works for which neither Capital nor Revenue Accounts are kept, P.W.D.
Ordinary Works.

	RS.
Reserve—	
Minor original works	306
Establishment	70
Tools and plant	5
Total ...	381

To

Minor Works for which Capital and Revenue Accounts are kept.
Madras Water-supply and Irrigation Extension.
Revenue Account.
Chingleput Division.

	RS.
Extensions and improvements ...	310
Establishment	71
Total ...	381

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, V Circle.
" Examiner, Public Works Accounts.

IRRIGATION.
ACCOUNT.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated November, 10th.

Recd. *Encl.*

G.O., 10th Nov. 1894, No. 866 I.

NOVEMBER.

Funds

Certain transfers of — in the V Circle, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following paper :—

From M.R.Ry. N. RATNASABHAPATI PILLAY, Avargal, Executive Engineer, Negapatam Division, to the Superintending Engineer, V Circle, dated Negapatam, 25th October 1894, No. 676 S.E.

In continuation of this office letter No. 610, dated 17th September 1894, I have the honour to inform you that total expenditure to end of September 1894 on Tank Restoration Scheme works and repairs is Rs. 28,577 and Rs. 14,802 against the grant of Rs. 35,000 and Rs. 15,000, respectively, leaving only a balance of Rs. 6,423 and Rs. 198 under each of those heads, which is expected to be spent in October 1894; thus there will be very little left for the remaining five months of the official year.

2. In this stage of progress I beg to state that I consider it undesirable to stop the works (specially repairs) for want of funds. There are many more breaches in tanks yet to be closed. If these be not attended to in time, water cannot be stored up which means loss of revenue to Government and loss in many ways to the poor ryots.

3. Sub-Divisional officer, Pattukkóttai, promises to spend Rs. 15,000 under Original Works and Rs. 10,000 under Repairs if allotted in time in addition to the existing grant of Rs. 35,000 and Rs. 15,000 under each of those heads. I therefore beg that you will be so good as to obtain an additional allotment of Rs. 15,000 under Original Works and Rs. 10,000 under Repairs during the current official year.

4. I beg also to request the favour of early orders as to whether the repairs to breaches especially may not be proceeded with pending allotment of funds.

No. 399 E.I.

Forwarded to the Chief Engineer for Irrigation with form of application for the grants now asked for in supersession of former application (No. 363 E.I., dated 9th October 1894, item 32).

(Signed) J. C. LARMINIE,
Suptg. Engineer, V Circle.

1st November 1894.

ENCLOSURE.

REVISED application for modification of existing grants under Irrigation for the year 1894–95, V Circle.

Item number.	Division.	Work.	Amount of estimate.	Existing grant.	Modification applied for. Decrease.	Modification applied for. Increase.	Modification proposed. Decrease.	Modification proposed. Increase.	Revised grant.	Remarks.
		43. MINOR WORKS AND IRRIGATION. *Works for which Capital and Revenue Accounts are not kept.* Tank Restoration Works.		RS.		RS.		RS.	RS.	
32	Negapatam.	Original works ..	L.S.G.	35,000	..	15,000	..	15,000	50,000	Necessity for these additional grants explained in the Executive Engineer's letter No. 676 S.E. of 25th October 1894.
32-A	Do. ..	Repairs	Do.	15,000	..	10,000	..	10,000	25,000	

ORDER—dated 10th November 1894, No. 869 I., Public Works.

It is observed that of the additional grant of Rs. 15,000 applied for for Tank Restoration original works, Rs. 10,000 have already been sanctioned in G.O., No. 796 I., dated 20th October 1894.

2. The following transfers of funds are sanctioned :—

Irrigation.
43. Minor Works and Navigation.
Minor Works for which neither Capital nor Revenue Accounts are kept, P.W.D.

From Ordinary Works. Reserve—	RS.	*To* Tank Restoration Works. Negapatam Division.	RS.
Minor Original Works	15,000	Minor Original Works	5,000
Establishment	3,450	Repairs	10,000
Tools and Plant	225		15,000
		Establishment	3,450
		Tools and Plant	225
Total ...	18,675	Total ...	18,675

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
„ Superintending Engineer, V Circle.
„ Examiner, Public Works Accounts.

IRRIGATION.
ACCOUNT.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated November, 10th.

Recd. *Encl.*

G.O., 10th Nov. 1894, No. 869 I.

NOVEMBER.

Tank Restoration Works, Negapatam Division

Certain transfers of funds for —, sanctioned with remark.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

Read—the following paper :—

From Major W. L. C. BADDELEY, R.E., Superintending Engineer, II Circle, to the Chief Engineer for Irrigation, dated Bezwada, 19th October 1894, No. 1652 K.S.

With reference to your memorandum No. II/51 K.S., dated 15th March 1894, I have the honour to resubmit herewith plans and estimates, amounting to Rs. 1,710, for constructing ramps on Gudiváda channel of Pulleru in the Kistna Eastern division duly revised.

2. The plan of ramp at 12 miles 1 furlong has been altered similarly to the proposed ramp at 9 miles 7 furlongs as directed by you.

Enclosure.

Report to accompany an estimate for ramps to Gudiváda channel.

	RS.
Estimate	1,710

The estimate provides for a cattle crossing at 9 miles 70 chains and a bandy ramp at 12 miles 10 chains.

At 9 miles 70 chains there is a drain on the left side of the channel and a minor distributary on the right side. The ramp has been designed to have a slope of 1 in 5 and to rise 2 feet above F.S.L. on the banks of the main channel and 1·5 feet above F.S.L. on the banks of the side channel and drain.

At 12 miles 10 chains there is a drain on the left side of the channel and as a number of bandies cross the channel at this point the slopes of the ramp are made 1 in 6. The ramps are to be made of road metal 9 inches thick with a layer of quarry rubbish above and below. The sides are to be revetted with rough stone to prevent cattle knocking them to pieces. In small canals and channels this type of ramp has been found efficient.

(Signed) A. CHATTERTON,
Executive Engineer, Gudiváda division.

22nd November 1893.

ORDER—dated 10th November 1894, No. 870 I., Public Works.

The following estimate is sanctioned from the balance of the amount reserved for unforeseen works of the Kistna delta system, which will then be reduced to Rs. 95,390 :—

Capital Expenditure not charged to Revenue.
49. Irrigation.
Kistna Delta System.
Eastern Section.
I. Works.
Pulleru Canal.
3. Distributaries.
Gudiváda Channel.
5. Miscellaneous.

		RS.
1. Constructing a ramp at 9 miles 70 chains	... ...	1,010
2. Do. do. at 12 miles 1 furlong	... ...	700
	Total ...	1,710

2. This sanction is registered as No. 113 I. of 1894–95.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
„ Superintending Engineer, II Circle, with nine enclosures.
„ Examiner, Public Works Accounts.
„ Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated November, 10th.

Recd. *Encl.*

G.O., 10th Nov. 1894, No. 870 I.

NOVEMBER.

Ramps

Estimate of Rs. 1,710 for constructing — on Gudiváda channel in the Kistna Eastern division, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

Read—the following papers :—

From R. G. MACDONALD, Esq., Deputy Secretary to the Government of India, Public Works Department (Account—Irrigation), to the Secretary to the Government of Madras, Public Works Department, dated Simla, the 14th September 1894, No. 74 A.I.

I am directed to request that the Government of India may be furnished, as soon as the information is available, with the figures of assessed revenue for the year 1893–94 under the heads noted in the margin and divided between Major Irrigation Works and Minor Works and Navigation for which Capital and Revenue Accounts are kept.

Water rates.
Owner's rates.
Share of enhanced land revenue due to irrigation works.

No. 131 I.

Note by the Chief Engineer for Irrigation.

The following statement affords the information required by the Government of India :—

Systems.	Water rates.	Owner's rates.	Share of enhanced land revenue due to irrigation.	Total.
	RS.		RS.	RS.
Major—				
Gódávari delta system	22,60,898	..	1,56,777	24,17,675
Kistna do.	18,59,577	..	1,69,713	20,29,290
Pennér anicut	2,60,410	..	19,731	2,80,141
Sangam do.	2,95,891	..	17,670	3,13,561
Kurnool-Cuddapah canal	1,18,621	..	..	1,18,621
Barur tank project	11,040	..	5	11,045
Cauvery delta system	37,72,910	..	1,12,688	38,85,598
Srívaikuntam anicut	1,80,235	..	1,820	1,82,055
Rushikulya project	16,995	..	25	17,020
Total ..	87,76,577	..	4,78,429	92,55,006
Minor—				
Cumbum tank	38,010	..	497	38,507
Thadapalli channel	1,02,174	..	2,395	1,04,569
Arkenkota do.	27,016	..	276	27,292
Kalingaroyen channel	1,03,818	..	447	1,04,265
Pálár anicut do.	2,58,632	..	15,726	2,74,358
Poiney do. do.	89,205	..	5,182	94,387
Cheyáru anicut channel	82,363	..	3,341	85,704
Chembrambakam tank	55,784	..	840	56,624
Madras water-supply and irrigation extension	20,173	..	423	20,596
Vallúru anicut	4,934	..	973	5,907
Tirukkóyilúr anicut	98,924	..	3,034	1,01,958
Mehamattur do.	10,881	..	21	10,902
Vriddhachalam do.	23,891	..	323	24,214
Shatiatope do.	1,02,359	..	14,977	1,17,336
Pelandorai do.	28,751	..	193	28,944
Lower Coleroon anicut	3,78,198	..	53,832	4,32,030
Maradur anicut	1,86,889	..	253	1,87,142
Total ..	16,12,002	..	1,02,733	17,14,735

The delay in the submission of this information is due to the Board of Revenue having communicated the particulars for the Cauvery delta system only on the 2nd instant with its Proceedings, No. 460, Press, dated 1st November 1894.

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Chief Engineer for Irrigation.

8th Nov. 1894.

ORDER—dated 14th November 1894, No. 884 I., Public Works.

The Government observes that the delay in the submission of the information required was unavoidable owing to the introduction of the new settlement in the Tanjore district.

2. Ordered that a copy of these Proceedings be forwarded to the Government of India.

[Here enter No. 885 I., dated 14th November 1894.]

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Examiner, Public Works Accounts.
" Revenue Department.

ENDORSEMENT—dated 14th November 1894, No. 885 I., Public Works.

Forwarded.

(By Order.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

IRRIGATION.
ACCOUNT.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated November, 14th.

Recd. *Encl.*

G.O., 14th Nov. 1894, Nos. 884, 885 I.

NOVEMBER.

Assessed revenue for 1893-94 on account of Irrigation Works

Forwarding copy of Proceedings explaining the delay in the submission of the figures of —.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

Read—the following paper:—

From Major W. L. C. BADDELEY, R.E., Superintending Engineer, II Circle, to the Chief Engineer for Irrigation, dated Bezwada, 6th November 1894, No. 1799 K.S.

The Executive Engineer, Kistna Eastern division, reports that, owing to want of funds at the end of March 1894, work done to the extent of Rs. 700 on repairs, river conservancy, had to be paid for from the small grant of Rs. 1,000 for the current year and consequently applies for an additional allotment of Rs. 1,000 for maintaining the groynes at Kottapetta and other works which are absolutely necessary.

2. I have therefore the honour to request that you will be so good as to obtain the sanction of Government for an increase of Rs. 1,000 being granted to the Kistna Eastern division under "Repairs, River Conservancy."

3. This amount cannot be spared from the grants of any other division in the circle.

Order—dated 14th November 1894, No. 886 I., Public Works.

The following transfers of funds are sanctioned:—

Irrigation.
43. Minor Works and Navigation.

From Minor Works for which neither Capital nor Revenue Accounts are kept, P.W.D. Ordinary Works.	RS.	*To* Agricultural Works. Kistna Eastern Division. River Conservancy.	RS.
Reserve—			
Original works	1,000	Repairs	1,000
Establishment	230	Establishment	230
Tools and plant	15	Tools and plant	15
Total ...	1,245	Total ...	1,245

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, II Circle.
" Examiner, Public Works Accounts.

IRRIGATION.
ACCOUNT.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated November, 14th.

Recd. *Encl.*

G.O., 14th Nov. 1894, No. 886 I.

NOVEMBER.

Funds

Certain transfers of — to the Kistna Eastern division, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following paper :—

From A. H. GARRETT, Esq., Superintending Engineer, I Circle, to the Chief Engineer for Irrigation, dated Suradá, 5th November 1894, No. 37 C.

I have the honour to request that you will be good enough to arrange for a transfer of Rs. 3,685 from the existing grant of Rs. 1,55,000 under "42. Major Works (Working Expenses), Maintenance and Repairs," for the Gódávari Western division to the Rushikulya division.

2. The Executive Engineer, Rushikulya division, reports that the maintenance charges increase in proportion to the completion of original works and the additional grant is required to work out the maintenance estimates amounting to Rs. 11,842 already sanctioned.

3. The Executive Engineer, Western division, has consented to the above transfer of funds.

ORDER—dated 14th November 1894, No. 890 I., Public Works.

The following transfers of funds are sanctioned :—

Irrigation.
42. Major Works (Working Expenses).

From Gódávari Delta System. Gódávari Western Division.	RS.	*To* Rushikulya Project. Rushikulya Division.	RS.
Maintenance and repairs	3,685	Maintenance and repairs	3,685
Establishment	848	Establishment	848
Total ...	4,533	Total ...	4,533

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, I Circle.
" Examiner, Public Works Accounts.

IRRIGATION.
ACCOUNT.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated November, 14th.

Recd. *Encl.*

G.O., 14th Nov. 1894, No. 890 I.

NOVEMBER.

Funds

Certain transfers of — from the Gódávari Western division to the Rushikulya division, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following papers:—

From C. A. SMITH, Esq., Executive Engineer, Kistna Eastern Division, to the Superintending Engineer. II Circle, dated 4th November 1894, No. 3614.

[*Reference*—Your No. 1604 K.S., dated 15th October 1894.]

I have the honour to forward a statement of liabilities already incurred against Capital Works in excess of the existing grant and also the amounts absolutely necessary to be spent in the official year for completing works in progress.

2. I have to express my regret that I have exceeded my allotment, but at the same time beg to point out that I have several times brought to your notice the inadequacy of the present grant. I have several times gone carefully through my lists of works and given orders to curtail expenditure in every possible way, and I can confidently say that not only has no unnecessary work been carried out, but that any further curtailment of expenditure would most certainly have caused direct loss to Government in the shape of revenue and also from the fact that stopping work would in most cases have rendered useless what has already been done and it would all have had to be done again.

3. There has been an extension of cultivation during the current year of about 15,000 acres representing an increase of revenue of Rs. 60,000, a good deal of which is due to the works newly carried out and without which this increase would have been much reduced.

4. I must also again point out that the heaviest expenditure has been incurred in Cowtaram sub-division and is largely due to works put in hand by order of the Chief Engineer for Irrigation at the end of last official year and payment for which had necessarily to be made this year on account of the insufficiency of last year's grant for the late Gudiváda division.

5. As to the liabilities already incurred, the contractors must necessarily be paid and delay in doing so can only result in making it more difficult than it is already to get good contractors to take up work. I propose with your permission to send orders to pay up at once all such liabilities and I have the honour to request that you will be good enough to apply for the additional grant of Rs. 20,500 now absolutely necessary for the current year.

ENCLOSURE.

STATEMENT showing liabilities under Capital Works up to end of September 1894.

—	Northern sub-division.	Southern sub-division.	Cowtaram sub-division.	Total.	Particulars regarding grant and outlay.
	RS.	RS.	RS.	RS.	RS.
Grant. 49. Irrigation Major Works. Kistna Delta. Eastern Section. Works.					
Grant for 1894-95	..	..	..	..	76,824
Outlay up to end of September 1894	..	..	..	..	77,066
Excess ..	..	..	..	..	— 242

Statement showing liabilities under Capital Works up to end of September 1894—*cont.*

—	Northern sub-division.	Southern sub-division.	Cowtaram sub-division.	Total.	Particulars regarding grant and outlay.
	RS.	RS.	RS.	RS.	RS.
Liabilities.					
Work already done and not billed for and dues to contractors being deductions from bills ..	2,140	4,090	3,726	9,956	..
Expenditure required to complete works and to prevent loss to Government by having to do work twice over	4,170	2,145	3,979	10,294	..
Total ..	6,310	6,235	7,705	20,250	20,250
Total grant still required, say ..	..	..	..	..	20,500
Land.					
Grant	..	..	..	..	12,960
Outlay up to end of September 1894	..	..	..	..	4,404
Balance of grant ..	..	..	..	..	8,556

No. 1832 K.S.

Forwarded to the Chief Engineer for Irrigation with a request that the allotment asked for may be made.

2. Owing to the fact that the canals are only closed for three months, it is necessary to incur expenditure towards the close of the official year against the grants for the following year and the bulk of the expenditure in the Kistna Eastern division was incurred between the months of January and June 1894.

3. As a good deal of the unfinished work consists of sectioning banks, it is certain that, if not finished soon, the banks will subside and most of the work will have to be done over again.

4. It must also be remembered that against a grant of Rs. 1,37,656 in the preliminary issue of the budget for 1894–95, only Rs. 97,460 were granted in the final issue of the 30th April 1894 and in these circumstances it is impossible to regulate expenditure properly in a division like the Kistna Eastern where there is a large amount of work which must be commenced early and which cannot be stopped at short notice, without great loss to Government.

(Signed) W. L. C. BADDELEY, Major, R.E.,
Superintending Engineer, II Circle.

9th November 1894.

Telegram from the Secretary to the Government of India, Public Works Department, to the Joint Secretary to the Government of Madras, Public Works Department, Irrigation Branch, dated Simla, 13th November 1894, No. O 2 A.I.

Yours 12th. Additional grant Rs. 85,000 sanctioned under 49.

ORDER—dated 14th November 1894, No. $\frac{890}{A}$ I., Public Works.

Communicated to the Superintending Engineer, II Circle, for information.

2. The additional grant sanctioned by the Government of India will be distributed as shown below :—

Kistna Eastern Division.

	RS.
Works	69,106
Establishment	15,894
Total ...	85,000

3. The following deferred telegram will be sent :—

To the Superintending Engineer, II Circle.

"G.O. No. 817 I., dated 25th October 1894. Additional grant Rs. 85,000 including establishment sanctioned by Government of India for Kistna delta under 49."

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, II Circle.
" Examiner, Public Works Accounts.

IRRIGATION.
ACCOUNT.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated November, 14th.

Recd. *Excd.*

G.O., 14th Nov. 1894, No. $\frac{890}{A}$ I.

NOVEMBER.

Kistna Delta System

Sanction of the Government of India to an additional grant of Rs. 85,000 for the — under "49. Capital expenditure not charged to Revenue," communicated to the Superintending Engineer, II Circle, with remarks.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following papers:—

From the Superintending Engineer, IV Circle, dated 25th September 1894, No. 204 E.I.

Proceedings of the Board of Revenue (Revenue Settlement, Land Records and Agriculture), dated 7th November 1894, Mis. No. 6754.

Read—the following letter from Colonel R. R. E. DRAKE-BROCKMAN, R.E., Chief Engineer for Irrigation, to the Secretary to the Board of Revenue (Revenue Settlement, Land Records and Agriculture), dated 25th Oct. 1894, No. 570 M.:—

With reference to my letter No. 242 M., dated 7th May 1894, I have the honour to forward herewith duly approved the revised plans and estimates aggregating Rs. 4,790 as modified in this office for the Belur anicut and channel in the Salem division. On receipt of the sanction of the Board to the execution of the work, the amount required for expenditure on it during the current year will be allotted from the special grant placed at the disposal of this department for expenditure by Public Works Department officers on "Minor Works, Revenue Department."

ENCLOSURE.

REPORT to accompany the estimate for the restoration of Belur anicut at the head of Vasistanadi river valley, Atur taluk, Salem district.

The Belur anicut is the first of a series of eight anicuts, old native works, built across the Vasistanadi in Atur taluk. It is situated in Belur village at the extreme western limit of the taluk and built for the supply of Belur tank It was breached in 1880 and is in ruins. Belur tank is at present classed as a minor work in charge of the Revenue Department. *The restoration of the anicut was called for in Collector's letter, No. 403-Ver., dated 4th March 1892, addressed to the Superintending Engineer, IV Circle, bearing Superintending Engineer, IV Circle, endorsement No. 107 S.L., dated 7th March* 1892, calling for an estimate and plans for the restoration.

An estimate was received for Rs. 4,500 for restoring the old work; but on inspection I found the old work not worth the attempt, as the anicut proper has entirely disappeared: what remains forms, properly speaking, a surplus escape in the channel and this is utterly ruined and evidently has no proper foundation. It must be abandoned. A new anicut is required and this will cost only about three-fourths of the sum required for reconstruction of the work on its old lines. The accompanying estimate provides for a new solid work founded on rock along the line C.D. in the accompanying survey.

Owing to the long lapse of time since the work was destroyed, the leading channel to the Belur tank had been covered with prickly-pear. This I have had cleared and levels taken and this estimate provides for its rehabilitation and for the construction of a head sluice. Clearance from head downwards is only needed for a distance of 2,500 feet.

There is no direct irrigation in the leading channel to Belur tank, nor is any land commanded. The present ayacut of the Belur tank comprises—

	ACS.
In Belur village	112
In Athanurpatti village	35
	147

and there are said to be fifty more acres commanded which will be cultivated if the anicut is rebuilt, so that the restoration of the anicut should lead to considerable extension of irrigation.

(1) *The anicut.*—The catchment area of Vasistanadi above the site is 84 square miles; for this area C = 450 may be safely taken as sufficient giving maximum anticipated discharge $C.M.^{\frac{2}{3}} = 18{,}765$ cubic feet per second.

Putting crest level at 85·00,—a level which suits the Belur channel well,—with M.F.L. 94·00, an anicut with 210 feet length of crest will discharge 20,160 cubic feet per second. The fall of the river at site of this anicut is 1 in 100, so that the velocity of approach of 6 feet per second can be safely relied on in heavy floods.

$$D = L \times 3{\cdot}33\, h \sqrt{h + {\cdot}035} = 20{,}160 \text{ cubic feet per second.}$$

The new anicut foundation will be carried down on to solid rock; no apron will be needed. The required stone will, it is anticipated, be available from the ruins of the old work.

(2) *Head sluice* will be built as one is needed to exclude high floods.

(3) *Channel.*—The levels taken show that clearance is only needed for 2,500 feet.

For this length the channel will be recut with bed fall of 2 feet per mile, bed width 3 feet, side slope 1 to 1, the surface soil being loamy and sub-soil kunker. With 2 feet F.S.L. the discharge will be—

$$M = \frac{O}{X} = \frac{10}{8{\cdot}8} \quad \sqrt{\ } = \frac{11}{12} \sqrt{2MF} = \frac{11}{12} \sqrt{4} = \frac{22}{12} \text{ feet per second.}$$

$$D = O \sqrt{\ } = 20 \text{ cubic feet per second.}$$

The tank is near the anicut and the supply excellent so the irrigation might almost be treated as direct.

Discharge required for 200 acres at $2\frac{1}{3}$ cubic yards per acre per hour = 4 cubic feet per second. The section of channel is as proposed capable of supplying at 10 cubic yards per acre per hour.

Specifications.

Stone casing will have bond stones at every 3 feet.

Mortar—1 surki, 2 lime for the burnt unslaked, 3 sand.

Concrete—1 mortar, $2\frac{1}{2}$ stone jelly not greater than 1″ cubes to be thoroughly mixed dry, then watered and immediately laid in layer of 6 inches evenly over the whole work and well rammed till hard set.

All stone to be thoroughly clean and well wetted and work kept watered till hard set. Work in accordance with standard specifications.

(Signed) G. E. MANSON,
Ex. Engineer, Salem Division.

18th January 1894.

Resolution—dated 7th November 1894, Mis. No. 6754.

The execution of the work by the Public Works Department out of the funds referred to is sanctioned.

(True Extract.)

(Signed) P RAJARATNA MUDALIAR,
Secretary.

No. 134 I.

Submitted to Government. In his statement printed in Proceedings of the Madras Government, No. 666 I., dated 12th September 1894, the Superintending Engineer, IV Circle, applied for Rs. 1,500 for expenditure on the work during the current year.

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Chief Engineer for Irrigation.

12th Nov. 1894.

ORDER—dated 15th November 1894, No. 891 I., Public Works.

The following transfers of funds are sanctioned:—

Irrigation.
43. Minor Works and Navigation.
Minor Works, Revenue Department.

From Reserve.	RS.	*To* Salem Division.	RS.
Original works	1,500	Original works	1,500
Establishment	345	Establishment	345
Tools and Plant	23	Tools and Plant	23
Total ...	1,868	Total ...	1,868

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, IV Circle, with plans and estimates (18).
" Examiner, Public Works Accounts.
" Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated November, 15th.

Recd. *Encl.*

G.O., 15th Nov. 1894, No. 891 I.

NOVEMBER.

Funds

Certain transfers of — to the Salem division, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

Read—the following paper :—

From J. P. DAVIDSON, Esq., Officiating Superintending Engineer, V Circle, to the Chief Engineer for Irrigation, dated Chepâk, 10th October 1894, No. 364 E.I.

I have the honour to submit for sanction and allotment of funds under the open capital account enclosed abstract estimate of Rs. 2,920 for constructing dam across Pudumaniyar for the irrigation of high lands of Gopalasamudram and other villages in Shiyáli taluk, Tanjore division.

2. If the estimate is sanctioned and funds allotted at an early date, the work will be completed by March 1896. The work is remunerative.

Enclosure.

Report to accompany the estimate for constructing a dam across Pudumaniyar river for the irrigation of the high lands of Gopalasamudram and other villages.

	RS.
Amount of estimate	2,920

The high lands of Gopalasamudram and other villages in the Shiyáli taluk under the Pudumaniyar were badly off for water, and, on the urging of the concerned mirasidars the road bridge on Shiyáli-Anaikkára Sattiram road (road No. 28), about 2 miles below head of Gopalasamudram channel, was in 1877-78 converted into a regulator with regulations to shut it for 2½ days in the week for the sake of those high lands and leave it open for the remaining 4½ days to pass on the water for the lower irrigation. Even after the construction of that regulator the high lands in question have not been satisfactorily supplied, chiefly because the regulator was 2 miles below the head of the channel, which involved a loss of half a day (out of the 2½ days shutting), in the most favorable seasons, in allowing time for the dammed up water to back up to the channel's head. The river itself being a drainage stream, its general supply is indifferent and it is therefore highly necessary to put this regulator as near as possible to the head of Gopalasamudram channel so as to give it the utmost possible benefit. Further, the mirasidars concerned in the lower irrigation under the river loudly complain of short supply on account of keeping the river shut for 2½ days in the week at the present Puthur regulator. It is very necessary to try and reduce the shutting time in the interests of the lower irrigation which it might be practicable to do by putting the regulator some way higher up. Under these circumstances, it is considered desirable to build a new dam or regulator across the river about 1 mile and 3 furlongs above the present one on road No. 28.

2. The accompanying plans and estimate are accordingly prepared to construct a dam * just below head of Puthur channel. Puthur channel, supplying about 400 acres of an inam village on account of its very close proximity to the proposed dam, would overdraw water to the disadvantage of other Government lands in its present open headed state; to limit and regulate its supply provision is made in this estimate to put a cheap head sluice to it in a line with the front return of the dam. Provision is also made in it to make up the river banks just above and below the dam to the level of the top of wings at the dam and sloping down longitudinally both ways.

* Hydraulic calculation sheet attached.

24th December 1892.

(Signed) T. T. RAGHAVACHARI, Sub-Engineer.

(Signed) J. C. JOHNSTON, Ex. Engr., Tanjore Division.

ORDER—dated 15th November 1894, No. 892 I., Public Works.

The following estimate is sanctioned :—

Capital Expenditure not charged to Revenue.
49. Irrigation.
Cauvery Delta System.
Open Capital Account.
3. Distributaries.
3. Works.
Remunerative Work.
Constructing dam across Pudumaniyar.

	RS.
I. Works	2,920
II. Establishment	672
III. Tools and plant	38
Total ...	3,630

2. This sanction is registered as No. 118 I. of 1894–95 and will expire on the 31st March 1897.

3. The attention of the Superintending Engineer, V Circle, is drawn to the frequent misapplication in the sub-division officer's report therewith forwarded of the term "mirasidar" to the "puttahdar" of the Tanjore division. The instructions conveyed in G.O., No. 634 I., dated 4th September 1894, should be strictly attended to in future.

4. Ordered that a copy of these Proceedings be forwarded to the Government of India for information.

[Here enter No. 893 I., dated 15th November 1894.]

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
„ Superintending Engineer, V Circle, with plans and estimates.
„ Examiner, Public Works Accounts.
„ Revenue Department.

ENDORSEMENT—dated 15th November 1894, No. 893 I., Public Works.

Forwarded.

(By Order.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

IRRIGATION.
ACCOUNT.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated November, 15th.

Recd. *Encl.*

G.O., 15th Nov. 1894, Nos. 892, 893 I.

NOVEMBER.

Dam across Pudumaniyar

Forwarding copy of Proceedings sanctioning, with remarks, the estimate of Rs. 3,630 for constructing —, Cauvery delta system.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

Read—the following paper:—

From the Executive Engineer, Nellore Division, to the Superintending Engineer, II Circle, dated 7th September 1894, No. 299 S.E.

With reference to your letter No. 292 N.L., dated 18th July 1894, I have the honour to submit herewith a revised estimate, amounting to Rs. 9,230, for improvements of Karedu tank and supply channel in lieu of the original estimate, amounting to Rs. 16,200, sanctioned in G.O., No. 393 I., dated 20th April 1892, and request that you will be good enough to sanction the same. I do not propose to do any work in 1894–95 on the tank unless a breach is feared.

No. 436 N.L.

Forwarded to the Chief Engineer for Irrigation for favour of obtaining the sanction of Government to the revised estimate and comparative statement amounting to Rs. 9,230 in lieu of the estimate, amounting to Rs. 16,200, sanctioned in G.O., No. 393 I., dated 20th April 1892, for the improvements to Karedu tank in the Nellore division. A copy of this office No. 292 N.L., dated 18th July 1894, on Executive Engineer's letter No. 198, dated 9th July 1894, is forwarded.

2. The Executive Engineer reports that he is of opinion that the idea of excavating the channel and building the head sluice should be abandoned and efforts confined to repairing the tank, and I agree with him.

(Signed) W. L. C. BADDELEY, Major, R.E.,
Superintending Engineer, II Circle.

27th September 1894.

Order—dated 15th November 1894, No. 895 I., Public Works.

The following revised estimate is sanctioned in supersession of the estimate of Rs. 16,200 sanctioned in G.O., No. 393 I., dated 20th April 1892:—

Irrigation.
43. Minor Works and Navigation.
Minor Works for which neither Capital nor Revenue Accounts are kept, P.W.D.
Original Works.

	RS.
Improvements to Karedu tank, No. 24 of list of works in the Nellore division appended to G.O., No. 407 I., dated 6th July 1887, estimate	9,230

2. This sanction is registered as No. 115 I. of 1894–95.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, II Circle, with tracing and estimate.
" Examiner, Public Works Accounts.
" Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated November, 15th.

Recd. *Encl.*

G.O., 15th Nov. 1894, No. 895 I.

NOVEMBER.

Karedu Tank

Revised estimate of Rs. 9,230 for improvements to — in the Nellore division, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

Read—the following papers :—

From the Superintendent of Works, No. I Periyár Division, dated 3rd November 1894, No. 156 C.E.

From S. D. PEARS, Esq., Superintendent of Works, No. I Periyár Division, to the Chief Engineer, Public Works Department, dated Periyár, 6th November 1894, No. 161 C.E.

In supersession of this office letter No. 156 C.E., dated 3rd November 1894, and of the estimate of Rs. 10,000 forwarded therewith, I have the honour to submit an estimate, amounting to Rs. 11,400, for two oil engines obtained from England on indent sanctioned in G.O., No. 652 W., dated 8th March 1894.

2. The difference, which has just been intimated to this office by the General Superintendent, Public Works Stores, is said to be due to fall in exchange which had apparently not been sufficiently allowed for.

Order—dated 15th November 1894, No. 896 I., Public Works.

The following estimate is sanctioned from the balance of the amount reserved for tools and plant required for the Periyár project, which will then be reduced to Rs. 1,07,912 :—

Capital Expenditure not charged to Revenue.
49. Irrigation.
Periyár Project.
III. Tools and Plant.
4. Navigation Plant.

	RS.
Purchasing two oil engines, estimate	11,400

2. This sanction is registered as No. 116 I. of 1894–95.

(True Extract.)

(Signed) J. PENNYCUICK, Colonel, R.E.,
Secretary to Govt., P.W.D.

To the Chief Engineer for Irrigation.
" Superintendent of Works, No. I Periyár Division, with one estimate.
" Examiner, Public Works Accounts.
" Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated November, 15*th*.

Recd. *Encl.*

G.O., 15th Nov. 1894, No. 896 I.

NOVEMBER.

Oil Engines

Estimate of Rs. 11,400 for purchasing two — for No. I Periyár division, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

Read—the following paper:—

From A. S. RUSSELL, Esq., Executive Engineer, Buckingham Canal Division, to the Superintending Engineer, II Circle, dated 23rd October 1894, No. 1795.

With reference to your endorsement No. 236 B.C., dated 9th instant, I have the honour to submit a revised estimate, amounting to Rs. 10,200, for two engines and pumps required for use in this division. This estimate supersedes that sanctioned in G.O., No. 469 I., dated 20th June 1894, and the proposed outlay will be met from the balance available under Tools and Plant of the project estimates.

No. 270 B.C.

Forwarded to the Chief Engineer for Irrigation with reference to his memo. No. II/41 B.C., dated 27th September 1894, for favour of sanction of Government being obtained to the revised estimate for the engines and pumps.

(Signed) W. L. C. BADDELEY, Major, R.E.,
Superintending Engineer, II Circle.

1st November 1894.

No. 132 I.

Submitted to Government. In G.O., No. 469 I., dated 20th June 1894, sanction was accorded to the local purchase of a portable eight H.P. steam engine and pump at a cost of Rs. 3,500. It having been subsequently found that the cost of the machinery was much greater than anticipated, it was decided to obtain through the Store Department of the India office two engines and pumps complete—*vide* Proceedings of the Madras Government, No. 2513 W., dated 10th October 1894. The present estimate provides for the machinery indented for and involves an excess of Rs. 677 over the available balance of the amount reserved for tools and plant, to meet which and future demands it is recommended that Rs. 10,000 or Rs. 12,300 including establishment may be transferred to that head from the balance available for unforeseen works.

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Chief Engineer for Irrigation.

8th Nov. 1894.

Order—dated 15th November 1894, No. 897 I., Public Works.

In lieu of the sanction accorded in G.O., No. 469 I., dated 20th June 1894, the estimate, amounting to Rs. 10,200, for two engines and pumps required for the Buckingham canal is sanctioned, subject to the approval of the Government of India to the following redistribution of the total amount sanctioned * for the canal:—

* *Vide* Government of India letter No. 143 I., dated 30th July 1894.
Proceedings of the Madras Government No. 582 I., dated 14th August 1894.

	Sanctioned distribution.	Proposed redistribution.
	RS.	RS.
Direct charges—		
Works	68,19,843	68,09,843
Establishment	16,28,245	16,25,945
Tools and plant	1,63,912	1,76,212
Loss by exchange	2,000	2,000
Total ...	86,14,000	86,14,000

2. This sanction is registered as No. 117 I. of 1894–95 and classified as shown below:—

Irrigation.
43. Minor Works and Navigation.
Minor Works for which Capital and Revenue Accounts are kept.
Buckingham Canal.
Capital Account.
3. Tools and Plant.
5. Miscellaneous.

	RS.
Purchasing two engines and pumps, estimate	10,200

3. Ordered that a copy of these Proceedings be forwarded to the Government of India with a request that the transfer proposed in paragraph 1 above may be sanctioned.

[Here enter No. 898 I., dated 15th November 1894.]

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, II Circle.
" Examiner, Public Works Accounts.
" Revenue Department.

Endorsement—dated 15th November 1894, No. 898 I., Public Works.

Forwarded.

(By Order.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

IRRIGATION.
ACCOUNT.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated November, 15th.

Recd. *Encl.*

G.O., 15th Nov. 1894, Nos. 897, 898 I.

NOVEMBER.

Engines and Pumps

Forwarding copy of Proceedings sanctioning, with remarks, estimate of Rupees 10,200 for purchasing two — required for the Buckingham canal.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

Read—the following paper :—

From J. P. DAVIDSON, Esq., Officiating Superintending Engineer, V Circle, to the Chief Engineer for Irrigation, dated Chepâk, 19th October 1894, No. 376 E.I.

I have the honour to report that an estimate for the construction of an iron trough on masonry abutments in lieu of an existing wooden trough has been received from the Executive Engineer, Tanjore.

2. The trough is to carry a branch of the Gangadarapuram channel (of Nattar) across the Kondangy channel for the irrigation of 40 acres.

3. The work has been asked for by the Kudis concerned, who are willing to contribute the full cost of the estimate, which, according to Executive Engineer, is Rs. 187. I request that the sanction of Government, as required by G.O. No. 331 I., dated 14th June 1890, to the construction of the work from contributions, may be obtained. Government, I presume, in such cases reserve the right at any future time to alter, or, if necessary, reconstruct on different lines all works so sanctioned if in the interests of irrigation they deem it needful.

4. On receipt of orders sanctioning the execution of the work from contributions, the estimate will be sanctioned in this office.

No. 129 I.

Note by the Chief Engineer for Irrigation.

In G.O., dated 14th June 1890, No. 330 I., Public Works, Government ordered that no execution of works by private persons at their own expense will be allowed in connection with Government irrigation systems or works without the previous sanction of Government.

2. The Superintending Engineer, V Circle, now asks whether, when a work has been asked for by private persons who are willing to contribute the full amount of the estimate, Government reserve the right, at any future time, to alter, or, if necessary, reconstruct on different lines all works so sanctioned if in the interests of irrigation such a course is deemed necessary. The undersigned is of opinion that it should be distinctly laid down that the mere fact that the construction of an irrigation work has been paid for either fully or in part by private persons does not confer any rights and that the work in question becomes the property of Government who can modify it in any way which may be necessary in the interests of irrigation.

Madras, (Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
2nd Nov. 1894. Chief Engineer for Irrigation.

To the Joint Secretary to Government,
Public Works Department, Irrigation Branch.

ORDER—dated 15th November 1894, No. 899 I., Public Works.

His Excellency the Governor in Council concurs in the opinion of the Chief Engineer for Irrigation.

2. When contributions are made by private persons towards the cost of construction of irrigation works the contributors will be informed that the work on completion will become the property of Government.

3. Orders will be issued in the Revenue Department for this ruling being embodied in the Standing Orders of the Board of Revenue for general information.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
,, Superintending Engineers of Circles.
,, the Examiner of Public Works Accounts.
,, the Superintendent of Works, Periyár No. I Division.
,, the Revenue Department.

IRRIGATION

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated November, 15th.

Recd. *Encl.*

G.O., 15th Nov. 1894, No. 899 I.

NOVEMBER.

Irrigation Works

Orders laying down that when contributions are made by private persons towards the cost of construction of — they will, on completion, become the property of Government.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

Read—the following paper :—

No. 135 I.

Note by the Chief Engineer for Irrigation.

In G.O., dated 4th January 1892, No. 6 W., the adoption of the Government of India Public Works Code was ordered in this Presidency in all cases where there is not a distinct practical reason against it.

2. In the Madras Public Works Code agricultural works are, under G.O., No. 1902, dated 26th July 1876, divided into four sub-heads noted in the margin, while in the India Code a single head is considered to be sufficient. As there is no apparent advantage gained by sub-dividing agricultural works into sub-heads, it is recommended that the sub-division may be done away with and the classification of the Government of India Code be adhered to.

River conservancy.	Drainages.
River embankments.	Miscellaneous.

It is suggested that Superintending Engineers may be directed to submit in future, for the sanction of Government, all estimates for the embankment or conservancy of rivers which have not previously been embanked or conserved.

3. The following sub-heads under "Minor Irrigation Works for which neither Capital nor Revenue Accounts are kept, P.W.D.," should be adhered to although they are not recognized by the Government of India Code :—

(1) Old maintenance charges of works for which Capital and Revenue Accounts are kept.
(2) Ordinary Irrigation Works.
(3) Tank Restoration Works—
 (*a*) Investigation.
 (*b*) Execution.

4. As the works investigated by the Tank Restoration Parties are all works for which neither Capital nor Revenue Accounts are kept and Tank Restoration officers are not allowed to investigate new projects but merely to submit estimates to restore works to a fair standard of efficiency and as nothing is gained by sub-dividing these works into "Original Works" and "Repairs," it is suggested that all tank restoration works may in future be sanctioned under "Repairs."

5. The definition of "Original Works" as given in paragraph 909 of the Madras Code is somewhat arbitrary and it is suggested that the definition in the Government of India Code, volume I, chapter VII, paragraph 2, may be adopted, Superintending Engineers being directed to submit in future, for the sanction of Government, all estimates for Ordinary Irrigation Works for which neither Capital nor Revenue Accounts

are kept exceeding Rs. 2,500 which, with the previous expenditure incurred on those works during past five years, exceed five years' actual collection of revenue.

6. The accompanying statement shows the proposed changes.

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Chief Engineer for Irrigation.

12th Nov. 1894.

ENCLOSURE.

STATEMENT comparing the classification of expenditure under 43. Minor Works and Navigation and the definition of original works according to the Local and the Government of India Public Works Code.

Madras Public Works Code.	Government of India Public Works Code.	Remarks.
Classification of expenditure under 43. Minor Works and Navigation.		
Page 85, appendix F, section IV D— 1. Agricultural Works, divided into— River conservancy. River embankments. Drainages. Miscellaneous.	Page XII, appendix I, volume II— 2. Agricultural Works.	The Government of India Code to be adopted with the addition that all estimates for the embankment or conservancy of rivers which have not previously been embanked or conserved must be submitted for the sanction of Government.
2. Works for which neither Capital nor Revenue Accounts are kept.	1. Ordinary Irrigation and Navigation Works— Each of the above two heads is divided into— (1) Works for which neither Capital nor Revenue Accounts are kept. (2) Works for which only Revenue Accounts are kept.	The Madras Code to be adhered to. To reduce the unnecessarily large number of estimates under tank restoration execution, the sub-division into "Original Works" and "Repairs" under that head to be abandoned and all estimates sanctioned under Repairs.
3. Works for which Capital and Revenue Accounts are kept— Capital. Revenue. For distributing grants the head 2 is sub-divided into— (*a*) Old maintenance charges of works for which Capital and Revenue Accounts are kept. (*b*) Ordinary Irrigation Works. (*c*) Tank Restoration Works— (i) Investigation. (ii) Execution. For a few of the works under (*b*) a continuous record of expenditure is kept, but the grants are not provided separately for each of such works.	(3) Works for which Capital and Revenue Accounts are kept— Capital. Revenue.	
Each of all the above heads is divided again into the departmental heads which appertain to each head, viz.— Original Works. Repairs. Establishment. Tools and Plant. Compensation. Suspense Account. Refunds of Revenue. Receipts on Capital Account.	Each of all the above heads is divided again into the departmental heads which appertain to it, viz.— Original Works. Repairs. Establishment. Tools and Plant. Compensation. Suspense Account. Refunds of Revenue. Receipts on Capital Account.	
Definition of Original Works.		
Paragraph 909.—All entirely new works and additions and alterations to existing works are classed as original works.	Volume I, chapter VII, paragraph 2—The class original works will include all new construction whether of entirely new works or of additions and alterations to existing works.	The definition of original works given in chapter VII of the Government of India Code to be adopted, but all estimates for irrigation works exceeding Rs. 2,500 which, with the expenditure incurred during the previous five years, exceed five years' actual collection of revenue to be submitted for the sanction of Government.
Reconstruction of irrigation works, such as banks, channels, sluices, waste weirs, revetments, &c., is to be classed under original works only when any material change in the character of the work is proposed or when the tank or system to which the work appertains has paid no revenue for the past five years. Such general improvements to irrigation works as are estimated to cost more than the average of past five years' revenue dependent on the work will be classed as original works.		

ORDER—dated 16th November 1894, No. 902 I., Public Works.

The suggestions made by the Chief Engineer for Irrigation are approved for adoption from 1st April next.

2. Ordered that a copy of these Proceedings be forwarded to the Government of India for information.

[Here enter No. 903 I., dated 16th November 1894.]

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
,, all Superintending Engineers.
,, the Superintendent of Works, No. I Periyár Division.
,, the Examiner, Public Works Accounts.
,, the Revenue Department.

ENDORSEMENT—dated 16th November 1894, No. 903 I., Public Works.

Forwarded.

(By Order.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

IRRIGATION.
ACCOUNT.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated November, 16th.

Recd. *Encl.*

G.O., 16th Nov. 1894, Nos. 902, 903 I.

NOVEMBER.

Classification of expenditure under 43. Minor Works and Navigation and the definition of "Original Works"

Forwarding copy of Proceedings approving the suggestions made by the Chief Engineer for Irrigation with regard to the —.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following paper :—

From A. H. GARRETT, Esq., Superintending Engineer, I Circle, to the Chief Engineer for Irrigation, dated Janumilli, 1st Nov. 1894, No. 823 G.N.

I have the honour to submit herewith the completion report of works for July 1894 received from the Executive Engineer, Rushikulya division, and verified by the Examiner of Public Works Accounts, and to request that you will be good enough to move Government to authorise the Examiner, Public Works Accounts, to admit the excess expenditure of Rs. 24 incurred on the two works therein enumerated.

2. The excesses are trifling and the items require no explanation.

3. The amount of Rs. 248, being savings effected on the works, may be added to the provision for unforeseen works of the project.

ORDER—dated 16th November 1894, No. 904 I., Public Works.

The Examiner of Public Works Accounts is authorised to pass the outlay incurred on the works referred to, the net saving of Rs. 224 being added to the balance available for unforeseen works which will then be increased to Rs. 59,118.

2. This sanction is registered as No. 119 I. of 1894–95.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, I Circle, with completion report.
" Examiner, Public Works Accounts.

IRRIGATION.
ACCOUNT.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated November, 16th.

Recd. *Encl.*

G.O., 16th Nov. 1894, No. 904 I.

NOVEMBER.

Expenditure

The Examiner of Public Works Accounts authorised to pass the excess — incurred on certain works in the Rushikulya division.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

READ—the following paper :—

From A. H. GARRETT, Esq., Superintending Engineer, I Circle, to the Chief Engineer for Irrigation, dated 24th October 1894, No. 505 V.Z.

I have the honour to bring to your notice that the following estimates in the Vizagapatam division under Repairs, 43. Minor Works and Navigation for which neither Capital nor Revenue Accounts are kept, were sanctioned by my predecessor in 1891–92 and 1892–93 to be carried out from contributions under paragraph 1339 of Madras Public Works Code and the amounts to be contributed, which did not in each case exceed Rs. 500, were paid by the proprietors concerned and adjusted by the Executive Engineer during 1893–94 ; but the Examiner of Public Works Accounts in his statement of objectionable items of Vizagapatam division for May 1894 requires the sanction of Government under paragraph 78, chapter IX, volume I of the Public Works Code to the works being carried out from contributions—*vid* also G.O., No. 280 I., dated 28th March 1894. I therefore request that the requisite sanction of Government may be obtained :—

	Estimate. RS.
1 Closing breaches of Kristnamarazu channel, Sárada river left bank ...	860
1 Raising, strengthening, and revetting the front slope of the right bank of Krishnamarazu channel from Kondakirlava head sluice ...	670
1 Repairing Kasimadam	840
1 Closing breaches of Sárada river near Anakápalle	380
1 Closing breaches at right bank of Kristnamarazu channel above Sythal channel	105
1 Clearing silt in Babukhanudu channel	200
1 Repairing Chintamanu calingula at the right bank of Kristnamarazu channel	280
1 Closing breaches at the right bank of Kristnamarazu channel about 4 furlongs below head sluice	170
1 Repairing Kondakirlava head sluice and calingula	75

ORDER—dated 16th November 1894, No. 905 I., Public Works.

The execution by the Public Works Department of the works referred to si sanctioned.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
„ Superintending Engineer, I Circle.
„ Examiner, Public Works Accounts.
„ Revenue Department.

IRRIGATION.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated November, 16th.

Recd. *Encl.*

G.O., 16th Nov. 1894, No. 905 I.

NOVEMBER.

Contribution works

The execution by the Public Works Department of certain — in the Vizagapatam division, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Establishment.

READ—the following papers :—

Proceedings of the Board of Revenue (Land Revenue), dated 3rd November 1893, Mis. No. 6169.

Read—the following letter from J. STURROCK, Esq., Acting Collector of Tanjore, to the Acting Secretary to the Commissioners of Land Revenue, dated 13th October 1893, Ref. No. 2015-Ver. :—

In 1884 it was found necessary, owing to the chronic deficiency of the supply of water available for irrigation in the Pandavayar, to establish a "morai," or system of irrigation by turns.

2. To keep up this "morai" sixteen sluices have to be worked for which an establishment was sanctioned in G.O., No. 192 I., Public Works, dated 13th April 1889, on the condition that the cost should be collected from the mirasidars.

3. As is usual with voluntary contributions, great difficulty has been found in collecting the amount and the establishment is at present in abeyance.

4. Scarcity of water being felt in consequence, the ryots most affected have been petitioning the Collector and it has been suggested that a cess should be collected by the Revenue Department in the same way as is done in connection with some of the channels in Coimbatore.

5. The Coimbatore cesses, however, are in connection with comparatively small irrigation systems, and now that the Kalingaroyen and Thadapalli channels have been taken over by the Department of Public Works as Major Works for which Capital and Revenue Accounts are kept, I am in hopes that the levy of cesses in connection with these channels will cease as recommended by the Board (Board's Proceedings, dated 29th August 1893, No. 362).

6. The "morai" now in question is in connection with the distribution of water from a main channel, the Pandavayar, and affects the irrigation of about 19,000 acres. It seems to me, since the recent revision of the settlement at any rate, to be the clear duty of the Public Works Department in a large irrigation system to undertake at Government cost all that may be necessary for the distribution of water from the main channel, leaving to the nirgantis the distribution from the field channels.

7. If the Board agrees with me, I request that Government may be addressed on the subject.

Resolution—dated 3rd November 1893, Mis. No. 6169.

Submitted for the orders of Government.

2. The Board agrees with the Collector.

(True Extract.)

(Signed) W. S. MEYER,
Acting Secretary.

Mis. No. 4192, Revenue.

Transferred to the Public Works Department (Irrigation).

FORT ST. GEORGE,
16th November 1893.

(Signed) R. C. C. CARR,
Under Secy. to Government.

Proceedings of the Board of Revenue (Land Revenue), dated 24th April 1894, Mis. No. 2187.

Read—again Board's Proceedings, dated 21st February 1894, No. 900.

ABSTRACT—Communicating to the Collector of Tanjore Government Order directing him to ascertain the wishes of the mirasidars holding lands under each river of the Cauvery delta as regards the proposed change in the matter of the distribution of water and to submit their replies with an expression of his own opinion.

Read—also the following letter from H. M. WINTERBOTHAM, Esq., Collector of Tanjore, to the Secretary to the Commissioners of Land Revenue, dated Vallam, 9th April 1894, No. 805-Ver.:—

With reference to Board's Proceedings, dated 21st February 1894, Mis. No. 900 (Land Revenue), I beg to state that I am not acquainted with the system of water distribution obtaining in the Gódávari and the Kistna deltas and request that I may be referred to any papers on the subject. The district manuals do not describe what establishments are maintained for distribution purposes or how they are worked.

2. There are 28 large rivers and over 1,300 large channels classed as (3) Distributaries in the Tanjore delta. The Board is aware that there are in the delta about one hundred and forty-four thousand mirasidars, and I feel perplexed as to the proper method of ascertaining their wishes on this large question and shall be grateful if the Board will afford me its guidance. All the mirasidars who now get more water than their share would oppose any change, and all who now suffer by "existing arrangements" would be in favour of it. I expect the numbers on each side would very nearly balance. Nothing like a consensus of opinion can be expected, and I apprehend that the attempt to ascertain the general wish of the mirasidars will be found entirely fruitless.

Resolution—dated 24th April 1894, Mis. No. 2187.

The second paper read above will be submitted to Government with reference to G.O., dated 9th February 1894, No. 536.

2. As the Collector states that it is difficult to ascertain the wishes of the 140,000 ryots holding lands in the delta and that after all nothing like a consensus of opinion can be expected, the Board begs to resubmit the matter for the orders of Government.

3. The question raised in paragraph 6 of the Collector's letter submitted with Board's Proceedings, dated 3rd November 1893, Mis. No. 6169, was merely whether a regulation now, or until recently, actually carried out at the expense of the ryots should not fairly be carried out at the expense of Government. The contention of the Chief Engineer that Government should not bear the cost unless the Public Works Department be given plenary powers seems to the Board to be beside the question. On the other hand, it considers that the regulation of the distribution of water through river or main channel sluices is, without doubt, the duty of the State and therefore a charge payable by Government.

(True Copy and Extract.)

(Signed) L. M. WYNCH,
Secretary.

Mis. No. 1774, Revenue.

Transferred to the Public Works Department.

OOTACAMUND, 4th May 1894.

(Signed) E. GIBSON,
Ag. Secretary to Government.

Transfer endorsement of the Revenue Department, dated 1st August 1894, No. 1488.

From J. C. LARMINIE, Esq., Superintending Engineer, V Circle, to the Chief Engineer for Irrigation, dated Chembrambakam, 2nd November 1894, No. 396 E.I.

With reference to G.O., No. 641 I., dated 6th September 1894, I have the honour to invite your attention to this office No. 4 E.I., dated 9th January 1894, and now forward, in continuation thereof, copy of a report No. 661, dated 11th October 1894, received from the Executive Engineer, Negapatam Division, on the subject of regulation of water in the Pandavayar.

2. Proceedings of the Board of Revenue, Mis. No. 2187, dated 24th April 1894, bearing Revenue Department endorsement No. 1774 of 4th May 1894, with its accompaniments and your endorsement No. 2803 C., dated 31st August 1894, with its accompaniments, are returned.

ENCLOSURE.

From M.R.Ry. N. RATNASABAPATHY PILLAI, Avargal, Executive Engineer, Negapatam Division, to the Superintending Engineer, V Circle, dated 11th October 1894, No. 661 S.E.

With reference to your No. 306 N.G., dated 15th May 1894, I have the honour to refer you to this office No. 667 S.E., dated 22nd December 1893, in which report was made anent the establishment requirements for the regulation of the Pandavayar.

2. From this report it is gathered that there are sixteen sluices to be looked after and five men were proposed to look after their regulation, which number cannot conveniently be reduced. There are two cavelgars now on the section, and therefore I have considered that an establishment of three more men, if sanctioned, will suffice for the present for the regulation.

3. An estimate for the same is herewith submitted for favour of sanction.

Report.

There are a large number of sluices in the Pandavayar, of which sixteen are situated in the first reach of about seven miles. These channels have sluices at their heads with levels high and commanding the fields under them and with vent ways out of all proportion to requirements.

2. The question of regulation by improvements to these sluices is under consideration separately.

3. In the mean time for a proper distribution of the supply and prevent waste of water by the upper sluices, an establishment of five cavelgars at Rs. 5 per mensem was sanctioned under contributions and entertained for two years.

4. For some reason the contributors abstained and it has since been recommended that the establishment be maintained at Government expense.

5. There are at present two cavelgars on the conservancy establishment and this estimate is submitted to supplement the staff for regulation. The establishment is found in practice to be very essential to enable proper distribution of supply which is found very defective.

11th October 1894.

(Signed) N. RATNASABAPATHY PILLAI,
Executive Engineer.

No. 137 I.

Submitted to Government.

13th Nov. 1894.

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Chief Engineer for Irrigation.

ORDER—dated 20th November 1894, No. 907 I., Public Works.

The proposal to entertain three cavelgars at Rs. 4 per mensem each for supplementing the existing water regulation staff of the Pandavayar is approved, the cost being debited to the maintenance grant of the Cauvery delta system.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
,, Superintending Engineer, V Circle.
,, Examiner, Public Works Accounts.
,, Revenue Department.

IRRIGATION.
ESTABLISHMENT.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated November, 21th.

Recd. *Encl.*

G.O., 20th Nov. 1894, No. 907 I.

NOVEMBER.

Water regulation staff of the Pandavayar, Cauvery Delta System

The entertainment of three cavelgars for supplementing the existing —, approved.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

READ—the following paper :—

Proceedings of the Board of Revenue (Revenue Settlement, Land Records and Agriculture), dated 3rd November 1894, No. 463.

Read—the following papers :—

From the Collector	of Anantapur,	dated 30th July	1894,	No. 2385.
" "	of Arcot, North	" 23rd Aug.	"	" 807-Rev.
" "	of "	" 6th Oct.	"	" 1420-Rev.
" "	of Arcot, South	" 24th July	"	" 1462.
" "	of Bellary	" 25th Sept.	"	" 445-R.P.R.
" "	of Chingleput	" 25th July	"	" 1487-Ind.
" "	of Coimbatore	" 14th Sept.	"	" 1071.
" "	of Cuddapah	" 31st Aug.	"	" 4442-Ver.
" "	of Ganjám	" 23rd Sept.	"	" 91-Pl. Ver.
" "	of "	" 9th Oct.	"	" 91-Pdl. Ver.
" "	of Gódávari	" 11th Sept.	"	" 3360-Ver.
" "	of Kistna	" 2nd Aug.	"	" 2641-Ver.
" "	of Kurnool	" 5th "	"	" 1314-Dis. Ver.
" "	of "	" 21st "	"	" 1425-Dis. Ver.
" "	of "	" 14th Oct.	"	" 1707-Dis. Ver.
" "	of Madura	" 25th Aug.	"	" 2444-R.C. Pdl.
" "	of Nellore	" 22nd "	"	" 2746-Ver.
" "	of Salem	" 11th Sept.	"	" 2573.
" "	of Tanjore	" 3rd Oct.	"	" 2452-Ver.
" "	of Tinnevelly	" 6th Aug.	"	" 1824-Genl.
" "	of Trichinopoly	" 17th "	"	" 2300-Dis. Genl.
" "	of Vizagapatam	" 31st July	"	" 159.

Resolution—dated 3rd November 1894, No. 463.

The Board resolves to forward to the Chief Engineer for Irrigation the comparative statement of irrigation and rainfall for the official year 1893–94.

2. The season was on the whole favorable except in Nellore and in the adjoining taluks of Kurnool and Cuddapah. The average rainfall for the whole Presidency, excluding Madras, the Nilgiris and the two West Coast districts, was 39·74 inches against 36·51 inches in 1892–93 and 32·36 inches, the average of five years ending 1892–93. The south-west monsoon was slightly above the normal, but was 3·69 inches below that of the previous year. The north-east monsoon was very copious and exceeded that of 1892–93 by nearly 54 per cent. There were floods and breaches in the irrigation works in many districts, but no great damage was caused, except in Nellore. The Gódávari began to rise in June, attaining a height of 14·6 feet above the anikat crest on the 11th September 1893. The Kistna was in freshes early in June and rose to 12·80 feet over the crest of the anikat, once in the latter part of June and again on the 10th September 1893. The freshes in the Pennér and the Cauvery were good. Statements showing the rainfall in each district during each monsoon of the year under report compared with the average of the previous years, as also the details for each month, are appended.

3. The following abstract shows the area actually irrigated from Government sources in 1893–94 as compared with the irrigation in 1892–93 :—

—	Anikat and other important works—Classes I and II.		Other works—Classes III and IV.		Total.		Difference.
	1892-93.	1893-94.	1892-93.	1893-94.	1892-93.	1893-94.	
	ACS.	ACS.	ACS.	ACS.	ACS.	ACS.	ACS.
Government land ..	1,993,024	2,110,547	2,511,942	2,652,149	4,504,966	4,762,696	+ 257,730
Inam land	465,035	531,348	496,605	467,927	961,640	999,275	+ 37,635
Zemindari land ..	257,627	255,423	26,652	27,143	284,279	282,566	— 1,713
Total ..	2,715,686	2,897,318	3,035,199	3,147,219	5,750,885	6,044,537	+ 293,652
Difference ..	..	+ 181,632	..	+ 112,020	..	+ 293,652	..

NOTE.—The extent of inam and zemindari lands under "other works" for 1892-93 entered in the foregoing abstract differs from that given in paragraph 3 of Board's Proceedings, dated 3rd October 1893, No. 406. The discrepancy occurs in the statement for Vizagapatam and is due to the omission of figures relating to the whole inam and zemindari villages for which, the Collector states, reliable statistics are not available.

4. Owing to the more favorable character of the season during the year, there was on the whole an increase in irrigated area of 181,632 acres under the irrigation systems grouped under classes I and II and of 112,020 acres under the 3rd and 4th class works. In Nellore and in parts of the Ceded districts, where the south-west monsoon was deficient, there was a falling off in the area as shown below :—

	Decrease in acres.
Classes I and II.	
Pennér anikat ...	4,988
Sangam do. ...	3,011
Pálár do. ...	3,398
Class IV.	
Cuddapah district ...	31,120
Bellary do. ...	481
Anantapur do. ...	38,962

The decrease under "other works" in Ganjám is only apparent, and is due to the fact that the figures for 1892–93 include the irrigation under the Rushikulya project and the Ganjám minor rivers system, which are shown separately for the year under report.

(True Extract.)

(Signed) P. RAJARATNA MUDALIAR,
Secretary.

(True Copy.)

(Signed) SARABHALINGAM NAIDU,
First Assistant.

To the Chief Engineer for Irrigation.
Copy to the Collectors concerned.

APPENDIX I.

COMPARATIVE statement of rainfall in each district.

Districts.	Average of five years ending 1892–93.		1892–93.		1893–94.	
	South-west monsoon.	North-east monsoon.	South-west monsoon.	North-east monsoon.	South-west monsoon.	North-east monsoon.
Ganjám	28·82	15·24	36·31	19·70	43·14	10·97
Vizagapatam	34·22	11·44	37·98	19·98	46·64	9·87
Gódávari	27·63	11·49	30·18	22·52	31·57	24·06
Kistna	22·77	10·44	30·81	18·68	23·11	13·55
Nellore	12·70	14·79	20·18	16·01	10·82	32·20
Cuddapah	16·69	9·28	25·59	10·46	16·08	16·06
Anantapur	15·28	7·44	22·81	5·96	16·31	8·43
Bellary	16·18	6·65	20·75	9·03	19·03	9·29
Kurnool	20·89	7·47	28·13	13·47	19·11	8·79
Chingleput	19·11	19·28	28·79	9·12	15·88	31·55
North Arcot	20·52	14·33	28·88	8·99	16·89	22·81
South Arcot	18·75	18·69	22·80	8·87	17·23	31·88
Tanjore	16·26	24·60	19·33	13·47	16·80	36·59
Trichinopoly	14·91	15·67	14·34	11·97	15·93	25·01
Madura	11·64	18·08	12·25	12·58	12·23	21·32
Tinnevelly	7·47	20·11	8·34	12·65	4·50	18·47
Coimbatore	12·68	11·22	14·48	9·90	12·21	17·53
Salem	19·61	10·20	24·23	7·56	21·37	17·05
Average ..	18·67	13·69	23·68	12·83	19·99	19·75

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APPENDIX II.

COMPARATIVE statement of rainfall in each month of the year 1893–94.

Months.	Rainfall.		
	Average of five years ending 1892–93.	1892–93.	1893–94.
April	1·03	1·03	1·11
May	1·78	1·22	2·11
June	2·94	4·34	3·65
July	3·56	4·21	5·54
August	4·52	7·66	3·31
September	4·84	5·22	4·27
Total of South-west monsoon ..	18·67	23·68	19·99
October	6·92	7·99	6·37
November	3·35	0·62	11·59
December	2·01	1·09	·40
January	0·21	0·33	·37
February	0·41	0·54	·52
March	0·79	2·26	·50
Total of North-east monsoon ..	13·69	12·83	19·75
Total for the year ..	32·36	36·51	39·74

APPENDIX III.

COMPARATIVE statement of irrigation and rainfall in the Madras Presidency for the years 1892–93 and 1893–94.

Works.	Items.	Area of the district in acres.	Cultivable area in acres.	Cultivated area in acres.	Areas irrigated. Sown from April to November 1893, *i.e.*, 1st crop. Total acres.	In comparison with 1892–93 Increase.	In comparison with 1892–93 Decrease.	Sown from December 1893 to March 1894, *i.e.*, 2nd crop. Total acres.	In comparison with 1892–93. Increase.	In comparison with 1892–93. Decrease.	Whole year, 1893–94. Total acres.	In comparison with 1892–93. Increase.	In comparison with 1892–93. Decrease.	Percentage of increase or decrease in 1893–94.	Rainfall. Monsoon.	1892–93.	1893–94.	Percentage of increase or decrease in 1893–94.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
						ACS.	ACS.		ACS.	ACS.		ACS.	ACS.					
Ganjám. Rushikulya Project.*	Government land.	..	..	..	3,050	3,050	..	3	3	..	3,053	3,053	..	..	..	..	..	..
	Inam land ..	..	..	..	3,375	3,375	..	..	..	..	3,375	3,375	..	..	..	..	..	..
	Zemindari land ..	..	..	..	2,452	2,452	..	..	..	..	2,452	2,452	..	..	..	..	..	..
	Total ..	..	..	..	8,877	8,877	..	3	3	..	8,880	8,880	..	..	..	..	..	..
Ganjám minor river system.*	Government land.	..	..	..	28,459	28,459	..	2,597	2,597	..	31,056	31,056	..	..	..	..	..	..
	Inam land ..	..	..	..	9,848	9,848	..	1,110	1,110	..	10,958	10,958	..	..	..	..	..	..
	Zemindari land ..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..
	Total ..	..	..	..	38,307	38,307	..	3,707	3,707	..	42,014	42,014	..	..	..	..	..	..
Other works.	Government land.	..	..	..	126,442	..	30,899	6,944	..	351	133,386	..	31,250	— 18·98	..	..	..	..
	Inam land ..	..	..	..	27,023	..	10,678	398	..	1,012	27,421	..	11,690	— 29·89	..	..	..	..
	Zemindari land ..	..	..	..	..	..	10,042	..	..	..	..	..	10,042	—100·0	..	..	..	..
	Total ..	..	..	..	153,465	..	51,619	7,342	..	1,363	160,807	..	52,982	— 24·78	..	..	..	..
Total ..	Government land.	2,841,233	437,789	401,235	157,951	610	..	9,544	2,249	..	167,495	2,859	..	+ 1·74	South-west monsoon.	36·31	43·14	+ 18·81
	Inam land ..	232,687	134,329	118,830	40,246	2,545	..	1,508	98	..	41,754	2,643	..	+ 6·76	North-east monsoon.	19·70	10·97	— 44·31
	Zemindari land ..	2,282,240	..	2,452	2,452	..	7,590	..	..	..	2,452	..	7,590	— 75·58				
	Total ..	5,356,160	572,118	522,517	200,649	..	4,435	11,052	2,347	..	211,701	..	2,088	— 0·98	..	56·01	54·1[illegible]	— 3·39
Vizagapatam.	Government land.	301,320	174,774	174,774	58,348	4,088	..	16,358	..	2,290	74,706	1,798	..	+ 2·47	South-west monsoon	37·98	46·64	+ 22·80
	Inam land ..	151,548	58,528	58,528	28,248	..	453	7,011	276	..	35,259	..	177	— 0·50	North-east monsoon.	19·98	9·87	— 50·60
	Zemindari land ..	327,088	..	..	..	..	..	..	..	..	..	..	..	..				
	Total ..	779,956	233,302	233,302	86,596	3,635	..	23,369	..	2,014	109,965	1,621	..	+ 1·50	..	57·96	56·51	— 2·50

Godavari.																		
Gódávari anikat.	Government land.	* ..	..	..	322,244	15,846	..	* 32,931	5,012	..	355,175	20,858	..	+ 6·24	..	..	..	..
	Inam land ..	..	..	..	182,635	16,019	..	25,081	4,510	..	207,716	20,529	..	+10·97	..	..	..	..
	Zemindari land ..	..	..	..	141,220	..	205	16,513	2,364	..	157,733	2,159	..	+ 1·39	..	..	..	..
	Total ..	..	..	..	646,099	31,660	..	74,525	11,886	..	720,624	43,546	..	+ 6·43	..	..	..	..
Other works.	Government land.	..	..	..	50,497	..	869	2,955	..	6,960	53,452	..	7,829	−12·78	..	..	..	..
	Inam land ..	..	..	..	21,853	213	..	1,593	..	3,115	23,446	..	2,902	−11·01	..	..	..	..
	Zemindari land ..	..	..	..	3,867	3,758	..	..	..	..	3,867	3,758	..	+3447·71	..	..	..	..
	Total ..	..	..	..	76,217	3,102	..	4,548	..	10,075	80,765	..	6,973	− 7·95	..	..	..	..
Total ..	Government land.	2,442,589	1,129,786	725,522	372,741	14,977	..	35,886	..	1,948	408,627	13,029	..	+ 3·29	South-west monsoon.	30·18	31·57	+ 4·61
	Inam land ..	549,280	477,895	445,547	204,488	16,232	..	26,674	1,395	..	231,162	17,627	..	+ 8·25	North-east monsoon.	22·52	24·06	+ 6·84
	Zemindari land ..	2,037,538	824,152	426,616	145,087	3,553	..	16,513	2,364	..	161,600	5,917	..	+ 3·80				
	Total ..	5,029,407	2,431,833	1,597,685	722,316	34,762	..	79,073	1,811	..	801,389	36,573	..	+ 4·78	..	52·70	55·63	+ 5·56
Kistna.																		
Kistna anikat.	Government land.	..	..	..	288,951	19,388	..	1,333	..	3,589	290,284	15,799	..	+ 5·76	..	..	..	..
	Inam land ..	..	..	..	97,825	21,534	..	372	..	788	98,197	20,746	..	+26·79	..	..	..	..
	Zemindari land ..	..	..	..	94,126	..	6,502	36	36	..	94,162	..	6,466	− 6·43	..	..	..	..
	Total ..	..	..	..	480,902	34,420	..	1,741	..	4,341	482,643	30,079	..	+ 6·65	..	..	..	..
Other works.	Government land.	..	..	..	25,551	..	5,120	3,137	..	2,136	28,688	..	7,256	−20·19	..	..	..	..
	Inam land ..	..	..	..	5,494	923	..	253	..	279	5,747	644	..	+12·62	..	..	..	..
	Zemindari land ..	..	..	..	11,033	4,834	..	2,248	355	..	13,281	5,189	..	+64·13	..	..	..	..
	Total ..	..	..	..	42,078	637	..	5,638	..	2,060	47,716	..	1,423	− 2·90	..	..	..	..
Total ..	Government land.	3,517,269	2,351,973	1,676,310	314,502	14,268	..	4,470	..	5,725	318,972	8,543	..	+ 2·75	South-west monsoon.	30·81	23·11	−24·99
	Inam land ..	759,765	654,106	503,351	103,319	22,457	..	625	..	1,067	103,944	21,390	..	+25·91	North-east monsoon.	18·68	13·55	−27·46
	Zemindari land ..	711,347	336,709	231,465	105,159	..	1,668	2,284	391	..	107,443	..	1,277	− 1·17				
	Total ..	4,988,381	3,342,788	2,411,126	522,980	35,057	..	7,379	..	6,401	530,359	28,856	..	+ 5·71	..	49·49	36·66	−25·92
Nellore.																		
Pennér anikat.	Government land.	..	..	..	33,501	..	5,297	16,672	851	..	50,173	..	4,446	−8·14	..	..	..	..
	Inam land ..	..	..	..	11,363	..	721	5,501	179	..	16,864	..	542	−3·11	..	..	..	..
	Zemindari land ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Total ..	..	..	..	44,864	..	6,018	22,173	1,030	..	67,037	..	4,988	−6·93	..	..	..	..
Sangam anikat.	Government land.	..	..	..	48,061	..	2,490	11,250	..	1,021	59,311	..	3,511	−5·59	..	..	..	..
	Inam land ..	..	..	..	9,241	..	587	1,374	1,087	..	10,615	500	..	+4·94	..	..	..	..
	Zemindari land ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Total ..	..	..	..	57,302	..	3,077	12,624	66	..	69,926	..	3,011	−4·13	..	..	..	..

* Detailed information regarding these works has not been furnished by the Collector. The figures for last year not being available they have been taken as *nil* for purposes of comparison.

Comparative statement of irrigation and rainfall in the Madras Presidency for the years 1892–93 and 1893–94—*cont.*

Works.	Items.	Area of the district in acres.	Cultivable area in acres.	Cultivated area in acres.	Areas irrigated. Sown from April to November 1893, *i.e.*, 1st crop. Total acres.	In comparison with 1892–93. Increase.	In comparison with 1892–93. Decrease.	Sown from December 1893 to March 1894, *i.e.*, 2nd crop. Total acres.	In comparison with 1892–93. Increase.	In comparison with 1892–93. Decrease.	Whole year, 1893–94. Total acres.	In comparison with 1892–93. Increase.	In comparison with 1892–93. Decrease.	Percentage of increase or decrease in 1893–94.	Rainfall. Monsoon.	1892–93.	1893–94.	Percentage of increase or decrease in 1893–94.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Nellore—cont.						ACS.	ACS.		ACS.	ACS.		ACS.	ACS.					
Other works.	Government land.	..	..	..	83,955	..	3,741	38,724	5,866	..	122,679	2,125	..	+ 1·76	..	..	..	..
	Inam land ..	..	..	..	24,343	13	..	10,331	832	..	34,674	845	..	+ 2·50	..	..	..	..
	Zemindari land ..	..	..	..	970	6	..	..	..	5	970	1	..	+ 0·10	..	..	..	..
	Total ..	..	..	..	109,268	..	3,722	49,055	6,693	..	158,323	2,971	..	+ 1·91	..	..	..	..
Total ..	Government land.	2,588,741	1,494,983	927,633	165,517	..	11,528	66,646	5,696	..	232,163	..	5,832	— 2·45	South-west monsoon.	20·18	10·82	— 46·38
	Inam land ..	645,819	516,518	335,719	44,947	..	1,295	17,206	2,098	..	62,153	803	..	+ 1·31	North-east monsoon.	16·01	32·20	+ 101·12
	Zemindari land ..	2,375,040	..	970	970	6	..	..	..	5	970	1	..	+ 0·10				
	Total ..	5,609,600	2,011,501	1,264,322	211,434	..	12,817	83,852	7,789	..	295,286	..	5,028	— 1·67	..	36·19	43·02	+ 18·87
Cuddapah.	Government land.	4,809,741	1,800,542	1,183,971	76,050	..	11,461	46,840	..	1,190	122,890	..	12,651	— 9·33	South-west monsoon.	25·59	16·08	— 37·16
	Inam land ..	778,832	682,783	478,878	48,001	..	12,595	25,452	..	8,874	73,453	..	21,469	— 22·62	North-east monsoon.	10·46	16·06	+ 53·54
	Zemindari land ..	..	..	..	..	..	..	..	..	..	..	..	..	..				
	Total ..	5,588,573	2,483,325	1,662,849	124,051	..	24,056	72,292	..	10,064	196,343	..	34,120	— 14·80	..	36·05	32·14	— 10·85
Anantapur.	Government land.	2,607,674	2,052,925	1,031,790	73,439	..	13,007	39,730	..	13,726	113,169	..	26,733	— 19·11	South-west monsoon.	22·81	16·[illegible]	— 28·50
	Inam land ..	678,171	667,627	356,976	19,497	..	9,675	13,024	..	2,554	32,521	..	12,229	— 27·33	North-east monsoon.	5·96	8·43	+ 41·44
	Zemindari land ..	..	..	..	..	..	..	..	..	..	..	..	..	..				
	Total ..	3,285,845	2,720,552	1,388,766	92,936	..	22,682	52,754	..	16,280	145,690	..	38,962	— 21·10	..	28·77	24·74	— 14·01

Bellary.	Government land.	3,038,024	2,512,310	1,144,528	35,022	1,835	..	4,950	..	1,776	39,972	59	..	+ 0·15	South-west monsoon.	20·75	19·03	— 8·29
	Inam land ..	840,704	746,407	392,716	10,776	..	97	1,142	..	443	11,918	..	540	— 4·33	North-east monsoon.	9·03	9·29	+ 2·88
	Zemindari land ..	..	..	..	..	..	..	..	..	..	..	..	..	..				
	Total ..	3,878,728	3,258,717	1,537,244	45,798	1,738	..	6,092	..	2,219	51,890	..	481	— 0·92	..	29·78	28·32	— 4·90
Kurnul.																		
Kurnul-Cuddapah Canal.	Government land.	..	..	..	16,738	3,650	..	3,276	..	3,368	20,014	282	..	+ 1·43	..	..	..	..
	Inam land ..	..	..	..	8,444	..	94	2,711	431	..	11,155	337	..	+ 3·12	..	..	..	..
	Zemindari land ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Total ..	..	..	..	25,182	3,556	..	5,987	..	2,937	31,169	619	..	+ 2·08	..	..	..	..
Cumbum tank.	Government land.	..	..	..	3,710	134	..	3,140	..	18	6,850	116	..	+ 1·72	..	..	..	..
	Inam land ..	..	..	..	1,763	37	..	1,438	158	..	3,201	195	..	+ 6·49	..	..	..	..
	Zemindari land ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Total ..	..	..	..	5,473	171	..	4,578	140	..	10,051	311	..	+ 3·19	..	..	..	..
Other works.	Government land.	..	..	..	29,631	..	4,238	12,973	4,749	..	42,604	511	..	+ 1·21	..	..	..	..
	Inam land ..	..	..	..	18,567	..	1,448	6,529	919	..	25,096	..	529	— 2·06	..	..	..	..
	Zemindari land ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Total ..	..	..	..	48,198	..	5,686	19,502	5,668	..	67,700	..	18	— 0·03	..	..	..	..
Total ..	Government land.	3,967,703	1,654,219	1,234,383	50,079	..	454	19,389	1,363	..	[illegible]9,468	909	..	+ 1·33	South-west monsoon.	28·13	19·11	— 32·07
	Inam land ..	841,257	832,098	655,787	28,774	..	1,505	10,678	1,508	..	39,452	3	..	+ 0·01	North-east monsoon.	13·47	8·79	— 34·74
	Zemindari land ..	..	..	..	..	..	..	..	..	..	..	..	..	..				
	Total ..	4,808,960	2,486,317	1,890,170	78,853	..	1,959	30,067	2,871	..	108,920	912	..	+ 0·84	..	41·60	27·90	— 32·93
Chingleput.																		
Chembrumbakam tank.	Government land.	..	..	..	9,594	114	..	5,660	2,420	..	15,254	2,534	..	+ 19·92	..	..	..	..
	Inam land ..	..	..	..	1,784	92	..	1,215	613	..	2,999	705	..	+ 30·73	..	..	..	..
	Zemindari land ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Total ..	..	..	..	11,378	206	..	6,875	3,033	..	18,253	3,239	..	+ 21·57	..	..	..	..
Madras water-supply and irrigation extension project.	Government land.	..	..	..	5,082	..	239	1,002	..	388	6,084	..	627	— 9·34	..	..	..	..
	Inam land ..	..	..	..	1,047	..	351	238	..	110	1,285	..	461	— 26·40	..	..	..	..
	Zemindari land ..	..	..	..	110	..	38	10	..	6	120	..	44	— 26·83	..	..	..	..
	Total ..	..	..	..	6,239	..	628	1,250	..	504	7,489	..	1,132	— 13·13	..	..	..	..

Comparative statement of irrigation and rainfall in the Madras Presidency for the years 1892–93 and 1893–94—*cont.*

Works.	Items.	Area of the district in acres.	Cultivable area in acres.	Cultivated area in acres.	Areas irrigated. Sown from April to November 1893, *i.e.*, 1st crop. Total acres.	In comparison with 1892–93. Increase.	De-crease.	Sown from December 1893 to March 1894, *i.e.*, 2nd crop. Total acres.	In comparison with 1892–93. Increase.	De-crease.	Whole year, 1893–94. Total acres.	In comparison with 1892–93. Increase.	De-crease.	Percentage of increase or decrease in 1893–94.	Rainfall. Monsoon.	1892–93.	1893–94.	Percentage of increase or decrease in 1893–94.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
						ACS.	ACS.		ACS.	ACS.		ACS.	ACS.					
Chingl put —cont.																		
Vallár anikat	Government land.	..	..	..	1,779	..	226	93	15	..	1,872	..	211	—10·13	..	..	..	..
	Inam land ..	..	..	..	2,474	..	104	91	22	..	2,565	..	82	— 3·10	..	..	..	..
	Zemindari land ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Total ..	..	..	..	4,253	..	330	184	37	..	4,437	..	293	— 6·19	..	..	..	..
Other works.	Government land.	..	..	..	240,022	..	31,027	92,460	54,598	..	332,482	23,571	..	+ 7·63	..	..	..	..
	Inam land ..	..	..	..	37,620	..	5,026	14,191	7,883	..	51,811	2,857	..	+ 5·84	..	..	..	..
	Zemindari land ..	..	..	..	1,898	..	598	555	27	..	2,453	..	571	—18·88	..	..	..	..
	Total ..	..	..	..	279,540	..	36,651	107,206	62,508	..	386,746	25,857	..	+ 7·16	..	..	..	..
Total ..	Government land.	1,312,590	739,901	616,965	256,477	..	31,378	99,215	56,645	..	355,692	25,267	..	+ 7·65	South-west monsoon.	28·79	15·88	— 44·84
	Inam land ..	265,243	220,355	124,188	42,925	..	5,389	15,735	8,408	..	58,660	3,019	..	+ 5·43	North-east monsoon.	9·12	31·55	+245·94
	Zemindari land ..	239,876	155,136	90,874	2,008	..	636	565	21	..	2,573	..	615	—19·29				
	Total ..	1,817,709	1,115,392	832,027	301,410	..	37,403	115,515	65,074	..	416,925	27,671	..	+ 7·11	..	37·91	47·43	+ 25·11
North Arcot.																		
Pálár anikat	Government land.	..	..	..	50,360	..	11,879	31,317	6,199	..	81,677	..	5,680	— 6·50	..	..	..	..
	Inam land ..	..	..	..	5,652	..	1,324	5,716	3,606	..	11,368	2,282	..	+25·12	..	..	..	..
	Zemindari land ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Total ..	..	..	..	56,012	..	13,203	37,033	9,805	..	93,045	..	3,398	— 3·52	..	..	..	..
Chéyár anikat.	Government land.	..	..	..	16,477	..	451	7,901	..	592	24,378	..	1,043	— 4·10	..	..	..	..
	Inam land ..	..	..	..	1,711	..	51	930	152	..	2,641	101	..	+ 3·98	..	..	..	..
	Zemindari land ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Total ..	..	..	..	18,188	..	502	8,831	..	440	27,019	..	942	— 3·37	..	..	..	..

Poiney anikat	Government land	..	..	..	15,574	..	5,147	8,584	5,285	..	24,158	138	..	+ 0·57	..	..	..	..
	Inam land	..	..	..	398	..	678	986	660	..	1,384	..	18	− 1·28	..	..	..	..
	Zemindari land	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Total	..	..	..	15,972	..	5,825	9,570	5,945	..	25,542	120	..	+ 0·47	..	..	..	..
Other works.	Government land	..	..	..	206,657	..	2,219	118,427	25,556	..	325,084	23,337	..	+ 7·73	..	..	..	..
	Inam land	..	..	..	27,563	..	3,084	15,531	3,784	..	43,094	700	..	+ 1·65	..	..	..	..
	Zemindari land	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Total	..	..	..	234,220	..	5,303	133,958	29,340	..	368,178	24,037	..	+ 6·98	..	..	..	..
Total	Government land	2,498,150	1,203,845	969,589	289,068	..	19,696	166,229	36,448	..	455,297	16,752	..	+ 3·82	South-west monsoon.	28·88	16·89	− 41·52
	Inam land	195,880	118,315	108,667	35,324	..	5,137	23,163	8,202	..	58,487	3,065	..	+ 5·53	North-east monsoon.	8·99	22·81	+ 153·73
	Zemindari land	2,179,840	..	..	..	..	..	..	..	..	..	..	..	..				
	Total	4,873,870	1,322,160	1,078,256	324,392	..	24,833	189,392	44,650	..	513,784	19,817	..	+ 4·01	..	37·87	39·70	+ 4·83
South Arcot.																		
Pelandorai anikat.	Government land	..	..	..	5,208	1,853	..	2,383	1,328	..	7,591	3,181	..	+ 72·13	..	..	..	..
	Inam land	..	..	..	531	3	..	236	96	..	767	99	..	+ 14·82	..	..	..	..
	Zemindari land	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Total	..	..	..	5,739	1,856	..	2,619	1,424	..	8,358	3,280	..	+ 64·59	..	..	..	..
Lower Coleroon anikat.	Government land	..	..	..	110,545	6,490	..	13,777	5,951	..	124,322	12,441	..	+ 11·12	..	..	..	..
	Inam land	..	..	..	8,397	577	..	1,240	30	..	9,637	607	..	+ 6·72	..	..	..	..
	Zemindari land	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Total	..	..	..	118,942	7,067	..	15,017	5,981	..	133,959	13,048	..	+ 10·79	..	..	..	..
Shatiatope anikat.	Government land	..	..	..	25,562	5,286	..	2,750	252	..	28,312	5,538	346	+ 24·32	..	..	..	..
	Inam land	..	..	..	1,869	..	219	224	..	127	2,093	..	..	− 14·19	..	..	..	..
	Zemindari land	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Total	..	..	..	27,431	5,067	..	2,974	125	..	30,405	5,192	..	+ 20·59	..	..	..	..
Vriddhachalam anikat.	Government land	..	..	..	4,752	1,845	..	1,871	503	..	6,623	2,348	7	+ 54·92	..	..	..	..
	Inam land	..	..	..	252	..	23	163	16	..	415	..	..	− 1·66	..	..	..	..
	Zemindari land	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Total	..	..	..	5,004	1,822	..	2,034	519	..	7,038	2,341	..	+ 49·84	..	..	..	..
Mohamattur anikat.	Government land	..	..	..	2,975	794	..	490	..	272	3,465	522	..	+ 17·74	..	..	..	..
	Inam land	..	..	..	146	48	..	76	20	..	222	68	..	+ 44·16	..	..	..	..
	Zemindari land	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Total	..	..	..	3,121	842	..	566	..	252	3,687	590	..	+ 19·05	..	..	..	..

Comparative statement of irrigation and rainfall in the Madras Presidency for the years 1892–93 and 1893–94 – *cont.*

Works.	Items.	Area of the district in acres.	Cultivable area in acres.	Cultivated area in acres.	Areas irrigated. Sown from April to November 1893, *i.e.*, 1st crop. Total acres.	In comparison with 1892–93. Increase.	De-crease.	Sown from December 1893 to March 1894, *i.e.*, 2nd crop. Total acres.	In comparison with 1892–93. Increase.	De-crease.	Whole year, 1893–94. Total acres.	In comparison with 1892–93. Increase.	De-crease.	Percentage of increase or decrease in 1893–94.	Rainfall. Monsoon.	1892–93.	1893–94.	Percentage of increase or decrease in 1893–94.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
						ACS.	ACS.		ACS.	ACS.		ACS.	ACS.					
South Arcot—cont.																		
Tirukkóyilúr anikat.	Government land.	..	..	..	23,083	643	..	11,794	5,090	..	34,877	5,733	..	+ 19·67	..	..	..	..
	Inam land ..	..	..	..	1,696	223	..	547	147	..	2,243	370	..	+ 19·75	..	..	..	..
	Zemindari land ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Total ..	..	..	..	24,779	866	..	12,341	5,237	..	37,120	6,108	..	+ 19·68	..	..	..	..
Other works.	Government land.	..	..	..	213,829	10,227	..	114,275	33,931	..	328,104	44,158	..	+ 15·55	..	..	..	..
	Inam land ..	..	..	..	13,649	..	441	6,321	2,080	..	19,970	1,639	..	+ 8·94	..	..	..	..
	Zemindari land ..	..	..	..	45	14	..	..	..	..	45	14	..	+ 45·13	..	..	..	..
	Total ..	..	..	..	227,523	9,800	..	120,596	36,011	..	348,119	45,811	..	+ 15·15	..	..	..	..
Total ..	Government land.	3,158,997	1,846,994	1,425,586	385,954	27,138	..	147,340	46,783	..	533,294	73,921	..	+ 16·09	South-west monsoon.	22·80	17·23	– 24·43
	Inam land ..	156,843	142,293	84,869	26,540	168	..	8,807	2,262	..	35,347	2,430	..	+ 7·38	North-east monsoon.	8·87	31·88	+ 259·41
	Zemindari land ..	22,400	13,979	3,486	45	14	..	..	..	..	45	14	..	+ 45·13				
	Total ..	3,338,240	2,003,266	1,513,941	412,539	27,320	..	156,147	49,045	..	568,686	76,365	..	+ 15·51	..	31·67	49·11	+ 55·07
Tanjore.																		
Upper anikat.	Government land.	..	..	..	749,387	..	7,212	83,356	23,169	..	832,743	15,957	..	+ 1·95	..	..	..	..
	Inam land ..	..	..	..	106,971	2,598	..	17,203	2,823	..	124,174	5,421	..	+ 4·56	..	..	..	..
	Zemindari land ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Total ..	..	..	..	856,358	..	4,614	100,559	25,992	..	956,917	21,378	..	+ 2·29	..	..	..	..
Other works.	Government land.	..	..	..	41,855	906	..	5,459	1,280	..	47,314	2,186	..	+ 4·84	..	..	..	..
	Inam land ..	..	..	..	2,776	..	1,459	447	..	137	3,223	..	1,596	– 33·12	..	..	..	..
	Zemindari land ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Total ..	..	..	..	44,631	..	553	5,906	1,143	..	50,537	590	..	+ 1·18	..	..	..	..

Total ..	Government land.	1,583,541	1,199,237	1,004,453	791,242	..	6,306	88,815	24,449	..	880,057	18,143	..	+ 2·10	South-west monsoon.	19·33	16·80	— 13·09
	Inam land ..	603,959	458,188	265,356	109,747	1,139	..	17,650	2,686	..	127,397	3,825	..	+ 3·10	North-east monsoon	13·47	36·59	+ 171·64
	Zemindari land ..	191,022	..	..	..	..	..	..	..	..	..	..	..	..				
	Total ..	2,378,522	1,657,425	1,269,809	900,989	..	5,167	106,465	27,135	..	1,007,454	21,968	..	+ 2·23	..	32 80	53·39	+ 62·77
Trichinopoly.	Government land.	1,716,904	1,238,695	844,871	109,470	7,160	..	52,586	10,280	..	162,056	17,440	..	+ 12·06	South-west monsoon.	14 34	16·93	+ 18·06
	Inam land ..	215,256	178,192	128,823	8,905	1,286	..	4,102	811	..	13,007	2,097	..	+ 19·22	North-east monsoon.	11·97	25·01	+ 108·94
	Zemindari land ..	391,680	321,105	16	16	16	..	..	..	..	16	16	..	..				
	Total ..	2,323,840	1,737,992	973,710	118,391	8,462	..	56,688	11,091	..	175,079	19,553	..	+ 12·57	..	26·31	41·94	+ 59·41
Madura ..	Government land.	2,043,222	1,257,819	933,809	177,828	16,692	..	71,408	19,247	..	249,236	35,939	..	+ 16·85	South-west monsoon.	12·25	12·23	— 0·16
	Inam land ..	217,898	203,280	84,817	15,967	1,315	..	6,640	2,976	..	22,607	4,291	..	+ 23·43	North-east monsoon.	12·58	21·32	+ 69·48
	Zemindari land ..	3,370,240	1,342,720	17	17	6	..	..	..	..	17	6	..	+ 54·55				
	Total ..	5,631,360	2,803,819	1,018,643	193,812	18,013	..	78,048	22,223	..	271,860	40,236	..	+ 17·37	..	24·83	33·55	+ 35·12
Tinnevelly.																		
Srívaikuntam anikat.	Government land.	..	..	..	18,059	3,289	..	12,938	1,735	..	30,997	5,024	..	+ 19·34	..	..	..	..
	Inam land ..	..	..	..	1,256	630	..	927	540	..	2,183	1,170	..	+ 115·50	..	..	..	..
	Zemindari land ..	..	..	..	99	89	..	857	..	394	956	..	305	— 24·19	..	..	..	..
	Total ..	..	..	..	19,414	4,008	..	14,722	1,881	..	34,136	5,889	..	+ 20·85	..	..	..	..
Marudur anikat.	Government land.	..	..	..	16,556	2,259	..	14,676	3,386	..	31,232	5,645	..	+ 22·06	..	..	..	..
	Inam land ..	..	..	..	668	66	..	548	94	..	1,216	160	..	+ 15·15	..	..	..	..
	Zemindari land ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Total ..	..	..	..	17,224	2,325	..	15,224	3,480	..	32,448	5,805	..	+ 21·79	..	..	..	..
Other works.	Government land.	..	..	..	91,840	18,579	..	159,448	40,952	..	251,288	59,531	..	+ 31·05	..	..	..	..
	Inam land ..	..	..	..	10,586	4,107	..	13,077	3,520	..	23,663	7,627	..	+ 47·56	..	..	..	..
	Zemindari land ..	..	..	..	3,449	1,909	..	2,732	150	..	6,181	2,069	..	+ 50·32	..	..	..	..
	Total ..	..	..	..	105,875	24,595	..	175,257	44,632	..	281,132	69,227	..	+ 32·67	..	..	..	..
Total ..	Government land.	1,893,660	1,526,702	1,296,215	126,455	24,127	..	187,062	46,073	..	313,517	70,200	..	+ 28·85	South-west monsoon.	8·34	4·50	— 46·04
	Inam land ..	269,759	239,740	167,033	12,510	4,803	..	14,552	4,154	..	27,062	8,957	..	+ 49·47	North-east monsoon.	12·65	18·47	+ 46·01
	Zemindari land ..	928,950	668,706	178,047	3,548	1,998	..	3,589	..	234	7,137	1,764	..	+ 32·83				
	Total ..	3,097,369	2,435,148	1,641,295	142,513	30,928	..	205,203	49,993	..	347,716	80,921	..	+ 30 33	..	20·99	22·97	+ 9·43

Comparative statement of irrigation and rainfall in the Madras Presidency for the years 1892–93 and 1893-94—*cont.*

Works.	Items.	Area of the district in acres.	Cultivable area in acres.	Cultivated area in acres.	Areas irrigated. Sown from April to November 1893, *i.e.*, 1st crop. Total acres.	In comparison with 1892–93. Increase.	De-crease.	Sown from December 1893 to March 1894, *i.e.*, 2nd crop. Total acres.	In comparison with 1892–93. Increase.	De-crease.	Whole year, 1893–94. Total acres.	In comparison with 1892–93. Increase.	De-crease.	Percentage of increase or decrease in 1893–94.	Rainfall. Monsoon.	1892–93.	1893–94.	Percentage of increase or decrease in 1893-94.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
						ACS.	ACS.		ACS.	ACS.		ACS.	ACS.					
Coimbatore.																		
Tadapalli channel.	Government land.	..	..	..	15,258	2,432	..	316	..	387	15,574	2,045	..	+ 15·12	..	..	..	..
	Inam land ..	..	..	..	694	25	..	..	..	10	694	15	..	+ 2·21	..	..	..	..
	Zemindari land ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Total ..	..	..	..	15,952	2,457	..	316	..	397	16,268	2,060	..	+ 14·50	..	..	..	..
Arkankota channel.	Governmnnt land.	..	..	..	3,914	10	..	166	158	..	4,080	168	..	+ 4·29	..	..	..	..
	Inam land ..	..	..	..	181	10	..	78	75	..	259	85	..	+ 48·85	..	..	..	..
	Zemindari land ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Total ..	..	..	..	4,095	20	..	244	233	..	4,339	258	..	+ 6·19	.	..	..	..
Kalingaroyan anikat.	Government land.	..	..	..	9,723	26	..	8,207	35	..	17,930	61	..	+ 0·34	..	..	..	..
	Inam land ..	..	..	..	1,555	1	..	1,269	15	..	2,824	16	..	+ 0·57	..	..	..	..
	Zemindari land ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Total ..	..	..	..	11,278	27	..	9,476	50	..	20,754	77	..	+ 0·37	..	..	..	..
Othr works.	Government land.	..	..	..	61,061	676	..	22,392	5,298	..	83,453	5,974	..	+ 7·71	..	..	..	..
	Inam land ..	..	..	..	6,449	62	..	2,917	502	..	9,366	564	..	+ 6·41	..	..	..	..
	Zemindari land ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Total ..	..	..	..	67,510	738	..	25,309	5,800	..	92,819	6,538	..	+ 7·58	..	..	..	..
Total ..	Government land.	4,589,518	2,705,189	2,335,490	89,956	3,144	..	31,081	5,104	..	121,037	8,248	..	+ 7·31	South-west monsoon.	14·48	12·21	− 15·68
	Inam land ..	334,022	319,889	274,637	8,879	98	..	4,264	582	..	13,143	680	..	+ 5·46	North-east monsoon.	9·90	17·58	+ 77·07
	Zemindari land ..	106,880	86,968	..	..	..	..	..	..	..	..	..	..	..				
	Total ..	5,030,420	3,112,046	2,610,127	98,835	3,242	..	35,345	5,686	..	134,180	8,928	..	+ 7·13	..	24·38	29·74	+ 21·99

Salem.																	
Barur project. Government land.	..	..	..	2,137	15	..	1,325	527	..	3,462	542	..	+ 18·56	..	..	..	..
Inam land ..	..	..	..	190	..	25	108	55	..	298	30	..	+ 11·19	..	..	..	..
Zemindari land ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Total ..	..	..	..	2,327	..	10	1,433	582	..	3,760	572	..	+ 17·94	..	..	..	..
Other works. Government land.	..	..	..	112,350	1,094	..	29,236	8,203	..	141,586	9,297	..	+ 7·03	..	..	..	..
Inam land ..	..	..	..	8,566	214	..	3,085	976	..	11,651	1,190	..	+ 11·38	..	..	..	..
Zemindari land ..	..	..	..	274	12	..	39	39	..	313	51	..	+ 19·47	..	..	..	..
Total ..	..	..	..	121,190	1,320	..	32,360	9,218	..	153,550	10,538	..	+ 7·37	..	..	..	..
Total .. Government land.	3,448,257	1,704,516	1,450,636	114,487	1,109	..	30,561	8,730	..	145,048	9,839	..	+ 7·28	South-west monsoon.	24·23	21·37	— 11·80
Inam land ..	338,122	155,611	59,199	8,756	189	..	3,193	1,031	..	11,949	1,220	..	+ 11·37	North-east monsoon.	7·56	17·05	+ 125·53
Zemindari land ..	1,031,989	..	313	274	12	..	39	39	..	313	51	..	+ 19·47				
Total ..	4,818,368	1,860,127	1,510,148	123,517	1,310	..	33,793	9,800	..	157,310	11,110	..	+ 7·60	..	31·79	38·42	+ 20·86
Total anikat. Government land.	..	..	..	1,830,739	62,642	..	279,808	54,881	..	2,110,547	117,523	..	+ 5·90	..	..	..	..
Inam land ..	..	..	..	461,966	50,909	..	69,382	15,404	..	531,348	66,313	..	+ 14·26	..	..	..	..
Zemindari land ..	..	..	..	238,007	..	4,204	17,416	2,000	..	255,423	..	2,204	— 0·86	..	..	..	..
Total ..	..	..	..	2,530,712	109,347	..	366,606	72,285	..	2,897,318	181,632	..	+ 6·69	..	..	..	..
All other works. Government land.	..	..	..	1,813,847	..	41,324	838,302	181,531	..	2,652,149	140,207	..	+ 5·58	..	..	..	..
Inam land ..	..	..	..	335,883	..	36,823	132,044	8,145	..	467,927	..	28,678	— 5·70	..	..	..	..
Zemindari land ..	..	..	..	21,569	..	85	5,574	576	..	27,143	491	..	+ 1·47	..	..	..	..
Total ..	..	..	..	2,171,299	..	78,232	975,920	190,252	..	3,147,219	112,020	..	+ 3·67	..	..	..	..
Grand Total. Government land.	48,364,133	27,032,199	19,377,760	3,644,586	21,318	..	1,118,110	236,412	..	4,762,696	257,730	..	+ 5·72	South-west monsoon.	23·68	19·99	— 15·58
Inam land ..	8,075,045	6,806,154	4,643,921	797,849	14,086	..	201,426	23,549	..	999,275	37,635	..	+ 3·89	North-east monsoon.	12·83	19·75	+ 53·94
Zemindari land ..	16,196,130	3,749,475	934,256	259,576	..	4,289	22,990	2,576	..	282,566	..	1,713	— 0·59				
Total ..	72,635,308	37,587,828	24,955,937	4,702,011	31,115	..	1,342,526	262,537	..	6,044,537	293,652	..	+ 5·09	..	36·51	39·74	+ 8·85

No. 133 I.

Submitted to Government.

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Chief Engineer for Irrigation.

12th Nov. 1894.

ORDER—dated 20th November 1894, No. 908 I., Public Works.

The statement of irrigation and rainfall for 1893–94 received from the Board of Revenue will be forwarded to the Government of India.

[Here enter No. 909 I., dated 20th November 1894.]

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
,, Superintending Engineers.
,, the Revenue Department.

ENDORSEMENT—dated 20th November 1894, No. 909 I., Public Works.

Forwarded.

(By Order.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

IRRIGATION.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated November, 20th.

Recd.	*Encl.*

G.O., 20th Nov. 1894, Nos. 908, 909 I.

NOVEMBER.

Statement of Irrigation and Rainfall

Forwarding the — for 1893–94.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

READ—the following paper:—

G.O., dated 13th November 1894, Mis. No. 2336 L., Local and Municipal.

Read—the following letter from the President, District Board, Madura, dated 3rd November 1894, No. 129:—

With reference to G.O., Mis. No. 1628 L., dated 28th August 1894, communicating G.O., No. 537 I., Public Works Department, dated 24th July 1894, I have the honour to submit herewith copy of the Madura Taluk Board's resolution No. 61, dated 28th May 1894, sanctioning the allotment of Rs. 260 therein referred to from the budget provision of Rs. 500 for 1894–95, item No. 5 of statement III-A, new works.

ENCLOSURE.

Proceedings of the Madura Taluk Board, dated 28th May 1894.

* * * * *

No. 61.—Read letter No. 721, dated 18th May 1894, from the Chief Engineer, Tank Restoration Scheme, requesting sanction of the Taluk Board for incurring the expenditure of Rs. 260 for extending the sluices of Karumbalodywarswami Kamandi of Kodimangalam village.

Resolution.—Sanctioned from the allotment of Rs. 500 provided for in the budget for 1894–95.

Order—dated 13th November 1894, Mis. No. 2336 L., Local and Municipal.

The Accountant-General will be requested to place the sum of Rs. 260 referred to at the disposal of the Public Works Department.

(True Extract.)

(Signed) J. F. PRICE,
Chief Secretary.

ORDER—dated 20th November 1894, No. 910 I., Public Works.

The sum of Rs. 260 will be treated as an addition to the current year's grant under "43. Minor Works and Navigation, Provincial," and will be distributed as shown below:—

Minor Works for which neither Capital nor Revenue Accounts are kept, P.W.D.
Tank Restoration Scheme.
Madura Division.

	RS.
Original works	209
Establishment	48
Tools and plant	3
Total ...	260

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, VI Circle.
" Examiner, Public Works Accounts.
" Local and Municipal Department.

IRRIGATION.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated November, 20th.

Recd. *Encl.*

G.O., 20th Nov. 1894, No. 910 I.

NOVEMBER.

Funds

The sum of Rs. 260 placed at the disposal of the Public Works Department for extending certain sluices in Kodimangalam village, Madura district, treated as an addition to the current year's grant under "43. Minor Works and Navigation, Provincial."

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

Read—the following paper:—

From Lieut.-Colonel C. C. RAWSON, R.E., Superintending Engineer, III Circle, to the Chief Engineer for Irrigation, dated Bellary, 7th November 1894, No. 1868.

With reference to paragraph 2 of G.O., No. 424 I., dated 30th May 1894, I have the honour to forward a revised estimate for tools and plant for the Sagiléru project providing for all requirements under that head.

Enclosure.

Statement showing the sum required for tools and plant of Sagiléru project, Cuddapah division.

Item No.	Particulars.	Cost.	Railway fare and other charges.	Total.	Remarks.
	43. MINOR WORKS AND NAVIGATION.	RS.	RS.	RS.	
	Works for which Capital and Revenue Accounts are kept.				
	Sagiléru Project.				
	Tools and Plant.				
1	Ten-horsepower engine supplied by South Indian Railway and Company.	3,000	158	3,158	*Vide* Superintending Engineer's No. 725, dated 15th June 1894.
2	Repairs to the above engine	1,000	..	1,000	Under repair by Messrs. Rickie and Company.
3	Eight-horsepower engine supplied by Messrs. Rickie and Company.	3,564	294	3,858	G.O. No. 424 I. of 30th May 1894.
4	Centrifugal pumps	754	3	757	
5	Crab winch, one	261	20	281	
6	Contractor's pump, one	300	6	306	
7	Screw jacks, two	69	5	74	
8	Surki mill, bullockpower	353	4	357	Superintending Engineer's No. 3159 of 15th March 1894.
9	Morten, steam-power	653	31	684	G.O. No. 303 I. of 3rd April 1894.
10	Cast iron right angle bends	17	6	23	
11	Iron camp beds	56	9	65	Debited to tools and plant under instructions from the Examiner.
12	Surki screens	113	16	129	

Statement showing the sum required for tools and plant of Sagiléru project, &c.—*cont.*

Item No.	Particulars.		Cost.	Railway fare and other charges.	Total.	Remarks.
			RS.	RS.	RS.	
	Tools and Plant—*cont.*					
	13. Repairs and carriage of tools and plant ..		1,000	..	1,000	Expenditure up to September is Rs. 64. The balance of Rs. 936 has been applied for to meet the current expenditure.
	14. Miscellaneous tools—	RS. A. P.				
	Turn screw	0 11 0				
	Eleven files of sizes	11 13 7				
	Vice standing	20 8 0				
	Ratchet brace	9 3 10				
	Callipers in and out	4 13 10				
	Carpenter's compass 10" ..	1 11 3				
	Fitters square 12"	5 9 0				
	Saws, two	8 8 0				
		62 14 6	63	..	63	
			11,203	552	11,755	
	For unforeseen expenditure		..	..	2,493	
	Total ..		..	..	14,248	
	Amount provided in the revised estimate of the project which was sanctioned in G.O., No. 10 I., dated 9th January 1894.		..	..	3,248	
	Net amount for which sanction is required ..		..	..	11,000	

(Signed) S. B. MURRAY,
Executive Engineer.

No. 138 I.

Submitted to Government with a recommendation that the revised estimate as increased in this office from Rs. 12,000 to Rs. 14,248 be sanctioned.

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Chief Engineer for Irrigation.

14th Nov. 1894.

Order—dated 21st November 1894, No. 915 I., Public Works.

The revised estimate amounting to Rs. 14,248 for tools and plant required for the Sagiléru project is sanctioned in lieu of the sum of Rs. 3,248 provided for the purpose in the classified abstract estimate printed in Proceedings of the Madras Government No. 10 I., dated 9th January 1894. The total of the sanctioned estimate for direct charges of the Sagiléru project will now be increased to Rs. 3,61,000 as shown below :—

	RS.
Works	2,83,000
Establishment	63,752
Tools and plant	14,248
Total ...	3,61,000

2. This sanction is registered as No. 121 I. of 1894–95.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
„ Superintending Engineer, III Circle.
„ Examiner, Public Works Accounts.
„ Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated November, 21st.

Recd. *Encl.*

G.O., 21st Nov. 1894, No. 915 I.

NOVEMBER.

Tools and Plant

Revised estimate of Rs. 14,248 for — required for the Sagiléru project in the Cuddapah district, sanctioned with remarks.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

Read—the following paper :—

From Lieut.-Colonel C. C. RAWSON, R.E., Superintending Engineer, III Circle, to the Chief Engineer for Irrigation, dated Bellary, 15th October 1894, No. 1668.

In continuation of my letter No. 72 C., dated 26th September 1894, regarding the Thokapalli project, I have the honour to forward herewith an estimate for Rupees 4,140 for preliminary expenses for the Thokapalli project.

2. This estimate contains six items—

(a) *Inspection Bungalow.*—The Executive Engineer particularly requests that this building be sanctioned whether the project be carried out or not, as it is in a very central situation for the inspection of existing works, and there appear to be other schemes for extension of irrigation, &c., in the neighbourhood.

(b) *Boring Operations, &c.*—This estimate is required to cover expenditure already incurred.

(c) Same as (b).

(d) These buildings have been built. The estimate is required to cover expenditure already incurred.

(e) This item will not be required if the project is not to be carried out.

(f) Same remarks as (b) and (c).

Whether it be decided that the project is to be gone on with or not, I request that this estimate may be sanctioned as soon as possible, as the inspection shed is badly wanted, and the other items have to be sanctioned (with one exception) to avoid references from the Examiner.

Enclosure.

Report to accompany estimate for the construction of inspection bungalow at Thokapalli.

	RS.
Amount of estimate	1,500

Government having approved in Order No. 3239 W. of 1893 of the erection of a temporary inspection shed at Thokapalli, this estimate has been prepared in accordance with it.

Very early sanction is requested.

(Signed) J. ELLIOT,
Sub-Engineer.

Order—dated 21st November 1894, No. 916 I., Public Works.

The following estimate is sanctioned :—

Irrigation.
43. Minor Works and Navigation.
Minor Works for which neither Capital nor Revenue Accounts are kept, P.W.D.
Original Works.
Kurnool Division.

	RS.
Preliminary expenses for Thokapalli project, estimate	4,140

2. This sanction is registered as No. 122 I. of 1894–95.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, III Circle, with plans and estimates.
" Examiner, Public Works Accounts.
" Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated November, 21st.

Recd. *Encl.*

G.O., 21st Nov. 1894, No. 916 I.

NOVEMBER.

Thokapalli Project

Estimate of Rs. 4,140 for preliminary expenses for the — in the Kurnool district, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

Read—the following paper:—

From the Executive Engineer, Buckingham Canal Division, to the Superintending Engineer, II Circle, dated 26th October 1894, No. 1839.

I have the honour to suggest that the undermentioned deviation statements that were sanctioned by you be forwarded to Chief Engineer for Irrigation for the sanction of Government so that the savings may be added to reserve at the disposal of Government. This seems necessary in view of the fact that a complete estimate for the whole canal is now under preparation, and that provision has to be made from balance at disposal of Government for estimates still to be submitted:—

	RS.
(1) Constructing lock at the Musee north flood gate	18,500
Original estimate	21,400
Savings ...	2,900
(2) Constructing lock at the Mudigondi south flood gate	17,600
Original estimate	21,800
Savings ...	4,200

2. The original estimates were sanctioned in G.O., No. 833 I., dated 25th September 1893.

3. The deviation statements are resubmitted herewith.

No. 280 B.C.

Submitted to the Chief Engineer for Irrigation, for favour of obtaining the sanction of Government, for the deviation proposed in the works "Constructing Musee and Mudigondi locks." The savings of Rs. 7,100 on both of the above two works may be added to the balance available for unforeseen works of the canal.

(Signed) W. L. C. BADDELEY, Major, R.E.,
Superintending Engineer, II Circle.

7th November 1894.

Order—dated 21st November 1894, No. 917 I., Public Works.

The deviation statements for the two works referred to are sanctioned, the saving of Rs. 7,100 effected thereby being added to the balance available for unforeseen works of the Buckingham canal, which will then be increased to Rs. 1,27,915.

2. This sanction is registered as No. 120 I. of 1894–95 and supersedes that accorded in G.O., No. 833 I., dated 25th September 1893.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
„ Superintending Engineer, II Circle,
with two deviation statements.
„ Examiner, Public Works Accounts,
with copies of the two deviation statements.
„ Revenue Department.

IRRIGATION.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated November, 21st.

Recd. *Encl.*

G.O., 21st Nov. 1894, No. 917 I.

NOVEMBER.

Musee and Mudigondi Locks

The deviation statements for the works of constructing — in the Buckingham Canal Division, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

READ—the following papers :—

No. 165 C.E.

Progress Report for October 1894.

General.—Progress on works at Periyár was very considerably retarded by the weather, which, even for the time of year, was remarkably bad. The month was also an unfortunate one in the matter of accidents, of which there was one fatal and an unusually large number of minor ones more or less serious.

Labour continued plentiful, the average population of Periyár camp being 3,886.

Rainfall.—At Periyár 12·49 inches and at Thekady 9·64 inches against averages of 10·07 and 10·54, respectively, for the previous five years.

Health.—The Periyár hospital statistics for the month were as follows :—

Camp.	Average population.	Daily average attendance.	Total treated.	Ratio sick to 1,000 of population.	Deaths.	Ratio death to 1,000 of population.
Periyár	3,886	132·80	1,592	409·67	13	3·34

They show higher rates of both sickness and mortality than the preceding month. Though the health in the cooly camp, probably on account of the damp, was worse, that in the officers' camp was better than usual, and it is noteworthy that the river was in flood and the smell from the water absent during nearly the whole month. Samples of the water from the river and the various wells were sent to the Government analyst for examination as ordered by Government, but his results have not yet been reported.

The large number of accidents alluded to above can only be accounted for by the adage that misfortunes seldom come singly. The fatal accident mentioned was purely from misadventure due to a stone flying to an extraordinary distance from a quarry; but the others were, without exception, due to either carelessness or breach of rules on the part of the sufferers. In the two most serious cases—both the result of incredible carelessness—amputation of a finger and of part of the hand respectively were involved.

Main dam.—The quantities of material put into the dam were as follows :—

	C. FEET.
Concrete	104,404
Rubble	52,593
Total ...	156,997

The figures are somewhat in advance of those for the preceding month, but were, like them, kept down by shortness of materials which the bad weather, the high level of the lake and the state of the roads made it impossible to collect in sufficient quantity. The total quantity of work done this season is above 240,000 cubic feet in excess of that done to the same date during the season of 1893-94 which was itself much in

advance of its predecessors, and it may be of interest to note that during the month under report 4,000,000 cubic feet had been built in all, or two-thirds of the work. The new steam launch arrived from England at the end of the month, and arrangements were made for putting it together. One of the two oil-engines, which arrived in September, was tried in a locally built boat but was a failure. The engine itself and also perhaps the handling of it (for want of experience) were both not without fault, but the failure was principally due to the boat which was not designed for the purpose. Arrangements are being made to supply a suitable boat, the faults in the engine have been rectified, and those in its working will be cured by a short time and a little more experience.

Left bank escape.—The excavation of foundations was proceeded with, and in the middle and right flank nearly completed. At the left flank the formation is most unconformable, and, except for a few small boulders, no sign of rock has been met with down to a depth of about 15 feet. Labour on the work has been increased and concentrated on the left flank.

Water-shed tunnel.—As recorded in last month's report a meeting was accurately effected by means of a heading from the northern to the southern boring. During the month the heading was taken out to full section and the tunnel is therefore complete with the exception of the regulating arrangements at its head. The rock cutting in preparation for these is in progress.

Miscellaneous.—The ghât ropeway and canal worked uninterruptedly throughout the month. Traffic on the road was a good deal hampered both on account of its submersion by the lake and on account of the bad weather. The supply of rice to the camp was kept uninterrupted, but that of materials for the dam fell occasionally short of the demand, as already noticed, for want of that portion of the fuel supply which depends on this route.

PERIYAR,
9th November 1894.

(Signed) S. D. PEARS,
Supt. of Works, No. 1 Periyár Divn.

To the Chief Engineer, Public Works Department.

Note by the Chief Engineer, Public Works Department.

Submitted for the information of Government.

2. The progress on the main dam continues good and greatly in advance of that of any previous year. The amount of masonry and concrete put into the dam during the four months from July to October has been—

	C. FEET.
In 1892	182,174
„ 1893	382,861
„ 1894	551,673

and the supply of materials will become more regular with the completion of the new steam launch and of boats for the oil-engines.

3. The appearance of the ground on the left flank is not very promising, but as remarked in my note on the report for September, it will not be any great evil to substitute an earthen bank for a masonry wall at this point; the final decision must be postponed until February when the ground will be dry.

4. There seems to be a clerical error in the last sentence of the report; it is not clear why any portion of the "fuel" supply should depend upon the road, or, at all events, upon that portion of it which is liable to be submerged by the lake. Every effort should be made to substitute water for land carriage as much as possible, now that there is uninterrupted communication from the main dam to No. II dam on the Mulya Panjan.

(Signed) J. PENNYCUICK, Colonel, R.E.,
Chief Engineer, P.W.D.

14th November 1894.

ORDER—dated 22nd November 1894, No. 918 I., Public Works.

Recorded and forwarded to the Government of India.

[Here enter No. 919 I., dated 22nd November 1894.]

(True Extract.)

(Signed) J. PENNYCUICK, Colonel, R.E.,
Secretary to Govt., P.W.D.

To the Superintendent of Works, No. I Periyár Division.
" Chief Engineer for Irrigation.
" Revenue Department.

ENDORSEMENT—dated 22nd November 1894, No. 919 I., Public Works.

Forwarded.

(By Order.)

(Signed) J. PENNYCUICK, Colonel, R.E.,
Secretary to Govt., P.W.D.

IRRIGATION.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated November, 22nd.

Recd. *Encl.*

G.O., 22nd Nov. 1894, Nos. 918, 919 I.

NOVEMBER.

Periyar Project

Forwarding Proceedings recording the progress report of works on the — in No. I Division for October 1894.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

Read—the following paper:—

Statement showing the surrenders and demands under Provincial Irrigation in Coimbatore Division, IV Circle.

Division.	Item number.	Name of work.	Amount of estimate.	Number and date of sanction.	Outlay to end of March 1894.	Outlay in the current year up to end of September 1894.	Balance of estimate.	Existing grant for 1894-95.	Proposed { Increase or decrease.	Revised or proposed grant.	Remarks.
1	2	3	4	5	6	7	8	9	10	11	12
			RS.		RS.	RS.	RS.	RS.	RS.	RS.	
Coimbatore.	1	Excavating a trench along the proposed site of the Muthikolam dam.	5,000	Not yet sanctioned.	664	1,699	2,637	..	4,300	4,300	A revised estimate has been submitted for sanction.
	2	Excavating a trench along the centre line of the proposed Bhaváni reservoir.	16,000	G.O., No. 1116 I., dated 18th December 1893, and Reg. No. 84 of 1893-94.	..	1,516	14,484	10,000	− 6,000	4,000	

(Signed) W. C. LEWIS,
Ex. Engr., Coimbatore Division.

9th November 1894.

No. 259 E.I.

Copy forwarded to the Chief Engineer for Irrigation with reference to his memo., No. IV/58 C.I., dated 10th October 1894, and with a request that he will be good enough to obtain the sanction of Government to the modifications of grants shown in the foregoing statement.

(Signed) J. HANNAN,
Suptg. Engineer, IV Circle.

13th November 1894.

Order—dated 22nd November 1894, No. 920 I., Public Works.

The modifications of grants proposed by the Superintending Engineer, IV Circle, are sanctioned; the net surrender of Rs. 1,700 from the current year's grant for excavating a trench along the centre line of the proposed Bhaváni reservoir dam is credited to the reserve under "43. Provincial Minor Works for which neither Capital nor Revenue Accounts are kept, P.W.D., Original Works."

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, IV Circle.
" Examiner, Public Works Accounts.

IRRIGATION.
ACCOUNT.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated November, 22nd.

Recd. *Encl.*

G.O., 22nd Nov. 1894, No. 920 I.

NOVEMBER.

Funds

Certain modifications of grants proposed by the Superintending Engineer, IV Circle, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

READ—again the following paper :—

G.O., dated 20th June 1893, No. 561 I., Public Works.

READ—also the following paper :—

From H. E. CLERK, Esq., Executive Engineer, North Arcot Division, to the Superintending Engineer, IV Circle, dated 25th October 1894, No. 487 S.E :—

With reference to your endorsement No. 122 N.A., dated 23rd March 1893, I have the honour to report that, in accordance with the instructions given by the Chief Engineer for Irrigation, estimates for supplying Vaniyanoor tank through Elathur tank were prepared and forwarded to me by the late Sub-divisional officer, Arni. The estimates prepared by him were as follows :—

	RS.
(1) Repairs to Elathur tank supply channel	350
(2) Excavation of new channel to Vaniyanoor tank	4,050
(3) Supply sluice at head of channel not estimated for cost about ...	300
Total ...	4,700

2. The project also involved the alteration of the Local Fund bridge over the supply channel to Elathur tank, the floor of which was built too high without any reference to this department. The Local Fund Board were accordingly asked to alter the culvert at their own expense, and the further preparation of the estimates was delayed pending the receipt of a reply from the Board.

3. In the mean time I had an opportunity of inspecting the line of the proposed new channel and at once saw how utterly inadequate were the rates allowed by Supervisor Chinnasawmi Aiyengar. The channel is in deep cutting throughout, the maximum depth being 16·88 feet. The surface soil is not more than 1′ to 1′ 6″ deep on an average and below that is soft rock of a quartzlike nature. The Sub-divisional officer describes the cutting in the estimate as ¼ hard earth, ¼ gravel or moramboo, ¼ hard moramboo, ¼ loose or soft rock and allows a rate of Rs. 4 per 1,000 cubic feet. For a length of 2,400 feet the depth of the cutting exceeds 10 feet, and as the slopes could be cut at, say, ½ to 1 throughout, the spoil would have to be removed at considerable cost. A ryot who has lately sunk a well close by in much softer soil than we should have to go through has paid the following rates :—

	AS.	
3rd yard in depth	4	per cubic yard.
4th „ „	5	
5th „ „	8	

4. I do not know what he paid for the surface work, but it cannot have been less than As. 2 all round, which gives an average of As. 4–9, say, per cubic yard, or about Rs. 11 per 1,000 cubic feet. From my inspection of the pits which have silted up a good deal since they were excavated, I am sure that the work could not be done for less than Rs. 15 per 1,000 cubic feet and that I consider a low rate. A slight deduction from the quantity may be made from the fact that in most places a

slope of ½ to 1 will be found sufficient. Deducting one-eighth of quantity estimated for on that score, we get 872·529 — 109·066 = 763·463 cubic feet at 15 = Rs. 11,453 and the total estimate for cutting may be put down as Rs. 15,000 including compensation, contingencies and petty supervision, making a total for the project of Rs. 15,650.

5. There does not seem to be any authoritative forecast of increase of revenue from the Revenue Department, but the Supervisor has made the following forecast:—

	RS.
One hundred acres of waste land taken up under Vaniyanoor tank at Rs. 5 per acre ...	500
Dry in wet ...	75
Addition by double crop lands ...	100
Total ...	675

This would give a return of $4\frac{1}{4}$ per cent. on the outlay.

6. This figure is however based on the two following assumptions:—

(1) That no great amount of very hard rock requiring blasting would be met.

(2) That the full amount of the extra revenue forecasted would be realized.

I do not think either is the case. I feel morally certain that an immense amount of solid rock would have to be blasted and I think the revenue forecast is too sanguine.

7. I recommend therefore that the project be abandoned and that Vaniyanoor tank be handed back to the Revenue Department who were in charge of it prior to the issue of G.O., No. 561 I., dated 20th June 1893.

No. 245 E.I.

Copy forwarded to the Chief Engineer for Irrigation with reference to his memo. No. IV/27 N.A., dated 20th March 1893.

2. The undersigned concurs with the Executive Engineer in considering that the Vaniyanoor tank should be handed back to the Revenue Department.

(Signed) J. HANNAN,
Suptg. Engineer, IV Circle.

30th October 1894.

Order—dated 23rd November 1894, No. 924 I., Public Works.

In the circumstances reported, the proposal sanctioned in G.O., No. 561 I., dated 20th June 1893, is cancelled and the Vaniyanoor tank in the Polur taluk of the North Arcot district will be handed back to the Revenue Department.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, IV Circle.
" Examiner, Public Works Accounts.
" Revenue Department.

IRRIGATION.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated November, 23rd.

Recd. *Encl.*

G.O., 23rd Nov. 1894, No. 924 I.

NOVEMBER.

Vaniyanoor Tank

Orders directing that the — in the Polur taluk of the North Arcot district be handed back to the Revenue Department.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

READ—the following papers :—

G.O., dated 24th September 1894, No. 3733, Revenue.

G.O., dated 10th November 1894, No. 4343, Revenue.

Read—the following Proceedings of the Board of Revenue (Separate Revenue), dated 8th June 1894, Mis. No. 2516 :—

Read—the following letter from the Deputy Commissioner of Salt and Abkári Revenue, Central Division, dated 8th April 1894, No. 1543 :—

With reference to paragraphs 10 and 11 of my No. C-257, dated 2nd December 1889, regarding canal communication with Pandraka, I have the honour to state that this communication has since been so much improved that, except when the canals are closed for annual clearance, salt boats can now come to within about two miles of platform No. II.

2. The cartage over this length costs traders 9 pies per maund, the whole of which would be saved if a branch canal were constructed from the Bantumalli canal to platform II.

3. At my request the Superintending Engineer has had a rough estimate prepared for this length which amounts, he tells me, to Rs. 7,700 with Rs. 400 for annual clearing. Such a canal would of course be an immense boon to the traders with Hyderabad *viâ* Bezwada, and as I believe that Mr. McMaster's scheme, as now being modified by me, for improving the salt manufacture at Pandraka is sure of success, I hope the Board may see its way to obtaining the sanction of Government to the construction of the proposed branch canal, in which case I will ask the Superintending Engineer for a detailed plan and estimate.

Resolution—

Submitted to Government with reference to the correspondence ending with G.O., dated 9th February 1891, Mis. No. 935, Revenue, and with the request that instructions may be issued to the Department of Public Works for the preparation of the necessary plan and estimate for the proposed canal.

2. In its Proceedings, dated 11th May 1890, Mis. No. 1398, the Board made reference to the causes that contributed to the decrease in the transport of salt from Pandraka to the Nizam's dominions and suggested remedial measures. Among other things, steps have been taken since then for the improvement of the quality of the salt by deep irrigation and facilities have also been afforded by the Department of Public Works for the transport of salt from the factory by deepening and improving the Bantumalli canal. According to the Superintending Engineer's report the canal runs within two miles of the factory. The Deputy Commissioner now reports that considerable difficulty is still felt by the traders in transporting their salt, as, before reaching Bantumalli canal, the salt has to be conveyed a distance of about two miles

from platform No. II along a cart track (*vide* plan enclosed). He suggests that a branch canal be constructed connecting the main canal with the platform. As the sales of the Pandraka factory are likely to improve if facility is afforded for the transport of salt, the Board recommends the proposal for the sanction of Government. The traders will then be able to convey the salt by canal directly from the platform and at less expense than they now incur. It is reported that at present they have to pay cartage of 9 pies per maund for the distance between the platform and the canal.

3. The estimated cost of the canal, as reported by the Superintending Engineer, II Circle, is Rs. 7,700 and the annual upkeep about Rs. 400. The latter, together with interest at 5 per cent. on the initial outlay, will amount to Rs. 785. This sum may be recovered by means of a toll or license fee on boats plying on the proposed canal, regarding which the Deputy Commissioner will be called upon to submit detailed proposals if the scheme is approved.

4. The canal may be treated as a branch of the Bantumalli canal and the cost met from Provincial funds as in the case of the Manginapudi canal (*vide* G.O., dated 14th September 1893, No. 3381), or, if Government so directs, the work will be included in the schedule of salt works to be executed by the Department of Public Works for 1895–96.

Read—office-note from the Secretary to Government, Revenue Department, dated 7th August 1894, No. 43.

Read—the following letter from Colonel R. R. E. DRAKE-BROCKMAN, R.E., Chief Engineer for Irrigation, to the Secretary to Government, Revenue Department, dated 24th October 1894, No. 45 W. :—

With reference to your office-note No. 43, dated 7th August 1894, I have the honour to forward herewith letter No. 1600 K.S., dated 15th October 1894, from the Superintending Engineer, II Circle, explaining the action taken and proposed to be taken by this department with regard to the Pandraka salt factory.

2. As the proposed canal will cost a comparatively small sum, I see no objection to its being carried out under minor works and navigation and included in the general system of canals. The East Coast canal system licenses would then cover this canal and this department would have to look to increase of traffic to pay interest on cost of construction and maintenance. This would apparently only amount to Rs. 785 *plus* establishment and tools and plant and is too small a sum to justify special tolls.

ENCLOSURE.

From Major W. L. C. BADDELEY, R.E., Superintending Engineer, II Circle, to the Chief Engineer for Irrigation, dated Bezwada, 15th October 1894, No. 1600 K.S.

In reference to your memo. No. II/130 K.S. of 4th September 1894, I have the honour to inform you that the Bantumalli canal is now navigable up to the Upputeru, with which it is connected by Lakshimipuram lock, for nine miles in the year.

2. The Pandraka salt factory is situated one mile distant in a direct line from the canal and there is no road to it, only a mud bank across a swamp and a short length of donka through a village.

The actual line of communication must be over two miles in length.

3. There would be no difficulty in making a canal to the factory, but as it is not required in the interests of irrigation, the cost should not be debited to the Kistna system. The factory consists of three sets of buildings some distance apart, and it would be necessary to select one set as the central depôt to which the canal should be brought.

4. In this office letter No. 564 K.S. of the 29th May 1890, the conversion of the Kaldindikodu into a drain and surplussing into the west side channel of the Bundar canal are referred to as measures calculated to relieve the Lazabanda from the drainage, which during the months of December and January causes injury to the salt swamps by weakening the brine.

The first of these arrangements is connected with the Peddalanka project which has lately been sanctioned; the other depends on the proposals for remodelling the irrigation from the Bundar canal below Kankipaud, which are now being put into shape.

5. The inconvenience caused by the admission of drainage into the Lazabanda is, I understand, no longer felt, as it is now customary for the Coutaram Sub-division officer to arrange that there shall be no great discharge of drainage into the Lazabanda during December and January. I will see that the matter is gone into during the coming rainy season, and if further remedial measures are required, a report will be sent to you on the subject.

Order—dated 10th November 1894, No. 4343, Revenue.

The Government concurs in the view expressed by the Chief Engineer for Irrigation in his letter last read above.

2. The necessary orders will issue in the Public Works Department.

(True Extract.)

(Signed) E. GIBSON,
Secretary to Government.

ORDER—dated 26th November 1894, No. 927 I., Public Works.

Communicated to the Superintending Engineer, II Circle, who will see that the continuation of a canal to the Pandraka salt factory is carried out as soon as possible, the outlay being charged to Provincial Minor Irrigation Works for which neither Capital nor Revenue Accounts are kept, Public Works Department. The Superintending Engineer will apply for the necessary allotment of funds.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, II Circle.
" Examiner, Public Works Accounts.
" Revenue Department, with one plan.

IRRIGATION.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated November, 26th.

Recd. *Encl.*

G.O., 26th Nov. 1894, No. 927 I.

NOVEMBER.

Canal

Proceedings, Revenue Department, on the subject of constructing a branch — to the Pandraka salt factory in the Kistna district, communicated to the Superintending Engineer, II Circle, with remarks.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following paper :—

From Major O. V. BODDY, R.E., Superintending Engineer, VI Circle, to the Chief Engineer for Irrigation, dated Trichinopoly, 19th November 1894, No. 696 T.N.

I have the honour to request that the following modification of allotments in the Tinnevelly division may be sanctioned from the reserve, as the demands cannot be met from the existing grants :—

Item No.	—	Existing grant.	Modification of allotments applied for.		Modification of allotments proposed.	
			Reduction.	Increase.	Reduction.	Increase.
	CAPITAL EXPENDITURE NOT CHARGED TO REVENUE.	RS.	RS.	RS.	RS.	RS.
	49. *Irrigation.*					
	Srívaikuntam Anicut System.					
	Open Capital Account.					
	1. Head Works.					
1	Raising the crest of the Srívaikuntam anicut, estimate Rs. 1,890 sanctioned in G.O., No. 564 I., dated 31st July 1894	1,150	..	296	..	296
	IRRIGATION.					
	42. *Major Works* (*Working Expenses*).					
	Srívaikuntam Anicut System.					
2	Maintenance and Repairs (lump sum)	12,818	..	532	..	532
	43. *Minor Works and Navigation.*					
	Minor Works for which neither Capital nor Revenue Accounts are kept, P.W.D.					
	Ordinary Works.					
	Original Works, Major.					
3	Gengaikondan Sirukulam tank improvements, estimate Rs. 5,700 sanctioned in G.O., No. 394 I., dated 2nd May 1893	3,700	..	976	..	976
4	Pallikottai channel and Palamadai tank improvements, estimate Rs. 24,500 sanctioned in G.O., No. 807 I., dated 19th September 1893	12,989	..	208	..	208
	Total ..	..	..	1,184	..	1,184

2. *Item* 1.—Work completed but the amount applied for is required to pay the liabilities incurred, no additional funds having been allotted when the revised estimate was sanctioned.

Item 2.—Required to meet the liabilities incurred but not liquidated.

Item 3.—Completed and the excess will be dealt with on receipt of the completion report. The amount applied for is required to meet the excess outlay incurred on the work.

Item 4.—Required to complete the work.

ORDER—dated 26th November 1894, No. 928 I., Public Works.

There are no funds available to meet the demands for items 1 and 2.

2. Rs. 1,184 required for items 3 and 4 are appropriated from the balance of the reserve under "43. Provincial, Minor Works for which neither Capital nor Revenue Accounts are kept, Public Works Department, Original Works."

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
,, Superintending Engineer, VI Circle.
,, Examiner, Public Works Accounts.

IRRIGATION.
ACCOUNT.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated November, 26th.

Recd. *Encl.*

G.O., 26th Nov. 1894, No. 928 I.

NOVEMBER.

Funds

Certain modification of allotments in the Tinnevelly division, sanctioned with remarks.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

READ—the following paper :—

From S. D. PEARS, Esq., Superintendent of Works, No. I Periyár Division, to the Chief Engineer, Public Works Department, dated Periyár, 23rd November 1894, No. 171 C.E.

I have the honour to forward, for your perusal, the copy of a letter received from Messrs. Burn and Co., Calcutta, concerning a launch for one of the oil engines recently procured from England for this division. An attempt made to adapt one of the Periyár limestone boats for the purpose was, as reported in the progress report for October 1894, unsuccessful. There are not carpenters available to build an entirely new launch designed for the purpose, nor, were it otherwise, have they the skill required to build a boat on anything but the most rudimentary lines. I am therefore strongly of opinion that a suitable launch had best be made elsewhere and brought to Periyár.

2. With this end I have been in communication with several firms and with the General Superintendent, Public Works Stores, with the result that the enclosed letter from Messrs. Burn and Co. is the only offer worth considering.

3. Without more details than Messrs. Burn and Co. give, I am unable to frame a detailed estimate of the total cost of the launch, fitted up and floated in the Periyár lake. The skeleton is to be Rs. 1,650 however, the skin (to be made here) would be about Rs. 1,250, and the transport would cost about Rs. 600, making a total cost of about Rs. 3,500. (The fitting of the engine would not cost Rs. 50.)

4. A detailed estimate will be made as soon as possible, but as the works are rapidly nearing completion and it will probably be not less than a month before the drawings can be obtained from Messrs. Burn and Co. and a detailed estimate made therefrom, I beg to recommend that their offer may be accepted.

5. The second oil launch may be postponed for the present, as it will not in any case be required before July next.

ENCLOSURE.

From Messrs. BURN AND CO., Howrah Ironworks, to the Superintendent of Works, No. I Periyár Division, dated 16th November 1894, No. H.Q. 4143.

We have your No. 592 of 9th instant *re* skeleton for small launch and your instructions therein are clear. We fortunately have a launch running daily on our own business, the "Jess," exactly the dimensions of the one you propose to build, viz., 38′ × 7′ 6″ and drawing 3 feet, and we would give you a complete skeleton frames, deck beams, floors, stern and stern post and rudder, bulkheads and bunkers, partitions for the sum of Rs. 1,650. This sum does not include deck fittings as these, we think, you would be better to fit as required. We understand the sheathing or shell you refer to is to be of timber and we would make the bolts of length accordingly. We have wired you to-day: "Launch frame, complete, Rs. 1,650, delivered f.o.b. here within two months." Trusting to have your order.

ORDER—dated 26th November 1894, No. 929 I., Public Works.

Ordered that the following telegram be despatched to the Superintendent of Works, Periyár Project:—

"Your letter 171 C.E., dated 23rd November 1894. Purchase of launch frame sanctioned as proposed."

2. A complete estimate of the launch and fittings should be submitted as soon as possible.

(True Extract.)

(Signed) J. PENNYCUICK, Colonel, R.E.,
Secretary to Govt., P.W.D.

To the Superintendent of Works, Periyár Project.
„ Chief Engineer for Irrigation.
„ Examiner, Public Works Accounts.

IRRIGATION.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated November, 26th.

Recd. *Encl.*

G.O., 26th Nov. 1894, No. 929 I.

NOVEMBER.

Launch frame

The purchase of a -- from Messrs. Burn and Co., Calcutta, for use in No. I Periyár division, sanctioned with remark.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

READ—the following papers :—

From A. H. GARRETT, Esq., Superintending Engineer, I Circle, to the Chief Engineer for Irrigation, dated Russellkonda, 20th October 1894, No. 1405 G.D.

I have the honour to submit the usual annual statements connected with the working of staff boats in the Gódávari district for the official year 1893–94.

2. Appended is a statement which exhibits the actual amount at credit of each existing boat and the amount required as per calculation laid down in G.O., No. 662 I., dated 26th August 1878 :—

Number of boat.	Original cost.	Actual at credit.	Required.
	RS.	RS.	RS.
12 ..	820	493	820
13 ..	820	348	820
14 ..	1,400	1,654	1,400
15 ..	800	433	800
16 ..	1,250	1,125	1,145
17 ..	850	1,193	779
18 ..	1,400	1,566	1,167
19 ..	850	789	708
20 ..	1,400	834	933
21 ..	840	301	560
22 ..	1.783	581	742
23 ..	2,411	437	402
Total ..	14,624	9,754	10,276

3. Statement A attached to this letter shows that the earnings realized up to the end of the past official year on the staff boats amount to Rs. 22,738 and the charges for the same period to Rs. 12,984. The amount therefore available for repairs and reconstruction is Rs. 9,754 or Rs. 9,072 exclusive of Rs. 682 which represents the deficit on boats already sold as per statement A-I. The balance remaining to the credit of boats on 31st March 1894 is Rs. 1,204 short of the amount calculated according to the standard laid down in G.O., No. 662 I., dated 26th August 1878.

4. The total receipts realized during the year under review was Rs. 2,458 while the total expenditure amounted to Rs. 1,815.

5. No staff boats were sold during the year.

6. Subjoined is a statement showing the boats on which the receipts fell short of the outlay incurred during the year :—

Number of boat.	Receipts during the year.	Outlay during the year.	Amount at credit of boat to end of 1892–93.	Amount at credit of boat to end of 1893–94.	Difference.
	RS.	RS.	RS.	RS.	RS.
12 ..	119	185	559	493	66
13 ..	97	167	418	348	70
16 ..	225	232	1,132	1,125	7
21 ..	124	372	549	301	248

No. 12 *Boat.*—The difference is due to the cost of repairs to the boat during the year being in excess of the receipts.

No. 13 *Boat.*—She was only occupied for broken periods by officers of other departments and subordinates of this department.

No. 16 *Boat.*—The difference is trifling and the item requires no explanation.

No. 21 *Boat.*—The great difference is accounted for by the fact that the boat required extensive repairs and was only occupied during a portion of the year.

ENCLOSURES.

A.—Statement showing the date of completion, earnings, &c., of staff boats constructed, purchased, &c., in the Gódávari district, I Circle, for the official year 1893–94.

Boat number.	Class of boat.	Date of completion or purchase and cost. Year.	Amount.	Monthly rent.	Amount recovered up to end of March 1894 (actual collections).	Amount spent on repairs up to end of March 1894.	Amount reserved for repairs and reconstruction up to end of March 1894.
1	2	3	4	5	6	7	8
			RS.	RS.	RS. A. P.	RS. A. P.	RS. A. P.
12	Second-class staff boat ..	1878–79	820	12	1,889 14 1	1,397 1 9	492 12 4
13	Do. do. ..	1879–80	820	12	1,762 5 11	1,414 4 1	348 1 10
14	First-class do. ..	1880–81	1,400	24	3,604 13 8	1,950 7 4	1,654 6 4
15	Second-class do. ..	1880–81	800	16	1,619 5 1	1,186 13 1	432 8 0
16	First-class do. ..	1882–83	1,250	24	2,695 5 4	1,570 10 0	1,124 11 4
17	Second-class do. ..	1882–83	850	16	1,851 13 1	659 2 10	1,192 10 3
18	First-class do. ..	1882–83	1,400	24	2,699 14 6	1,134 0 5	1,565 14 1
19	Second-class do. ..	1882–83	850	12	1,529 0 6	739 11 6	789 5 0
20	First-class do. ..	1885–86	1,400	24	2,069 15 11	1,236 2 5	833 13 6
21	Second-class do. ..	1885–86	840	16	1,318 8 2	1,017 2 5	301 5 9
22	First-class do. ..	1888–89	1,783	30	1,176 8 4	595 3 7	581 4 9
23	Do. do. ..	1892–93	* 2,411	30	520 12 10	83 7 11	437 4 11
	Total ..	..	..	..	22,738 5 5	12,984 3 4	9,754 2 1

Rent for second-class staff boats is charged at Rs. 12 per mensem to subordinates drawing less than Rs. 200 per mensem (paragraph 1047-A of the Madras Public Works Code).

	RS.
* Value of upper part and fittings of No. 11 utilized for No. 23 (G.O., No. 50 I., dated 16th January 1892)	440
Cost of improvements	1,971
Total ..	2,411

(Signed) C. J. USSHER,
Ex. Engr., Gódávari Eastern Division.

A-I.—Statement showing staff boats sold in the Gódávari district, I Circle, for the official year 1893–94.

Boat sold.	Surplus.	Deficit.	Amount reserved for repairs.
	RS. A. P.	RS. A. P.	RS. A. P.
Total brought forward from statement A, column 8	..	..	9,754 2 1
Balance as per G.O., No. 1019 I., dated 21st November 1893	586 9 10	1,269 0 0	..
Boats sold in 1893–94	..	..	..
Total ..	586 9 10	1,269 0 0	682 6 2
Balance available for repairs and reconstruction ..	..	..	9,071 11 11

No. 141 I.

Submitted to Government.

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
20th Novr. 1894. Chief Engineer for Irrigation.

Office-note to the Examiner, Public Works Accounts, dated 3rd November 1894, No. 283.
" from " " " " 13th " " " 4468 D./A.

ORDER—dated 26th November 1894, No. 930 I., Public Works.

Recorded.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, I Circle.
" Examiner, Public Works Accounts.

IRRIGATION.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated November, 26th.

Recd. *Encl.*

G.O., 26th Nov. 1894, No. 930 I.

NOVEMBER.

Staff Boats

The financial results of — of the Gódávari delta system for 1893-94, recorded.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

Read—the following paper:—

From Major O. V. BODDY, R.E., Superintending Engineer, VI Circle, to the Chief Engineer, Public Works Department, dated Trichinopoly, 22nd November 1894, No. 1026 M.D.

I have the honour to submit, for sanction of Government, the following extract from the monthly report of works completed during the month of February 1894 in the late No. II Periyár division:—

Item No.	Name of work.	Amount of estimate.	Authority sanctioning the estimate.	Outlay.	Excess over the estimate.
		RS.		RS.	RS.
1	Excavation of main channel, 3rd reach ..	1,03,112	G.O., No. 823 I., dated 31st October 1894.	1,03,122	10

2. The completion statement has been duly verified by the Examiner of Public Works Accounts.

Order—dated 28th November 1894, No. 932 I., Public Works.

The Examiner of Public Works Accounts is authorised to pass the outlay incurred on the work referred to, the excess expenditure of Rs. 10 being met from the balance of the amount reserved for unforeseen works of the Periyár project which will then be reduced to Rupees 48,337.*

	RS.
Balance as shown in Chief Engineer's memorandum No. 3637 C., dated 16th November 1894 ..	48,057
Add amount erroneously deducted from the balance for works instead of from that for tools and plant in G.O. No. 840 I., dated 6th November 1894.	290
Total ..	48,347
Deduct amount now sanctioned	10
Balance still available ..	* 48,337

2. This sanction is registered as No. 124 I. of 1894–95.

(True Extract.)

(Signed) J. PENNYCUICK, Colonel, R.E.,
Secretary to Govt., P.W.D.

To the Chief Engineer for Irrigation.
" Superintending Engineer, VI Circle.
" Examiner, Public Works Accounts.

IRRIGATION.
ACCOUNT.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated November, 28th.

Recd. *Encl.*

G.O., 28th Nov. 1894, No. 932 I.

NOVEMBER.

Expenditure

The Examiner of Public Works Accounts authorised to pass the excess — incurred on the excavation of main channel, 3rd reach, Periyár project.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following paper :—

From C. MILDRED, Esq., Executive Engineer, Kistna Northern Division, to the Superintending Engineer, II Circle, dated 29th October 1894, No. 339 S.E.

I have the honour to forward herewith the annual statement of floating plant showing requirements of funds for its maintenance and upkeep for 1895–96.

2. You will observe that the grant applied for next year exceeds that of the current year by Rs. 10,480.

3. The increase appears to be necessary to put the floating plant in perfect working order—*vide* paragraph 4 of your No. 1619 K.S. of 16th October 1894 and also notes opposite the plant for which the additional funds are required.

4. Staff boats Nos. 19, 20 and 21 which were constructed last year have newly been brought on the statement.

ENCLOSURES.

STATEMENT of Irrigation floating plant in the Kistna district showing the estimated cost of upkeep during the year 1895–96.

PART I.—*Steamers and Steam Dredges.*

Present registered numbers.	Details of plant.	Value of plant. Original.	Value of plant. Present book value.	Probable cost of upkeep for 1895–96.	Remarks.
		RS.	RS.	RS.	
1	Steamer "Alexandria" ..	13,131	3,271	1,510	The machinery and hull are in fair order, but the boiler is very weak ; hence value of a new boiler is now provided for.
	Special repairs	..	1,631	3,000	
	Total ..	13,131	4,902	4,510	
1	Dredge steam	15,614	— 3,306	480	In fair working order.
	Special repairs	..	113	200	
2	Dredge steam	15,614	— 4,334	480	
	Special repairs	..	..	300	
3	Dredge steam	28,357	— 11,403	..	Sold in public auction on 2nd October 1894 ; bought in for Rs. 800 ; will be broken up and used in shops.
5	Dredge steam	30,439	— 12,962	670	In fair working order.
	Special repairs	..	..	500	
1	Cockburn's dredger	5,034	3,761	300	In good working order ; working very satisfactorily.
	Value of iron punt No. 19 ..	2,299	1,665	245	The temporary deck made for increasing depth of boat has been found very useful, but as the wood is decayed provision is now made for improvements.
	Special repairs	..	..	500	
	Total, Dredges ..	97,357	— 26,466	* 3,675	

	RS.
* Maintenance	2,175
Special repairs	1,500
	3,675

PART II.—*Boats and Punts.*

Present registered numbers.	Details of plant. Description of boats.	Value of plant. Original.	Value of plant. Present book value.	Probable cost of upkeep for 1895-96.	Remarks.
		RS.	RS.	RS.	
1	Iron punt	2,812	426	245	On stock. Hull bad; could not be repaired this year for want of funds.
	Special repairs	..	..	1,000	
2	Iron punt	2,811	482	245	
	Special repairs	..	80		
3	Iron punt	2,812	721	245	
	Special repairs	..	230		
4	Iron punt	2,812	330	245	
	Special repairs	..	26		
5	Iron punt	2,812	357	245	
	Special repairs	..	243		
6	Scouring dam	..	..	245	
7	Iron punt	2,812	720	245	
	Special repairs	..	..		
8	Iron punt	2,812	85	245	
	Special repairs	..	277		
9	Iron punt	2,812	178	245	In fair order.
	Special repairs	..	22		
10	Iron punt	2,812	448	245	
11	Do.	2,811	578	245	
12	Do.	2,811	778	245	
	Special repairs	..	50		
13	Iron punt	2,811	— 35	245	
14	Do.	2,811	361	245	
15	Do.	2,811	436	245	
16	Do.	3,610	— 111	170	
	Special repairs	..	21		
18	Iron punt	2,186	— 93	245	
19	Do.	2,185	223	245	
	Special repairs	..	49		
20	Iron punt	2,172	1,000	245	
	Special repairs	..	69		
21	Iron punt	2,172	866	245	On stock. Hull could not be repaired this year for want of funds.
	Special repairs	..	41	1,000	
22	Iron punt	2,172	— 433	245	In fair order.
23	Do.	3,951	1,870	245	On stock; could not be repaired this year for want of funds.
24	Do.	2,172	335	245	
	Special repairs	..	310		
25	Iron punt	4,091	1,254	245	
26	Do.	2,299	370	245	In fair order.
	Special repairs	..	155		
27	Iron punt	5,916	2,742	245	
28	Do	1,584	98	190	
29	Do.	1,524	191	190	
30	Do.	1,524	188	190	On stock; could not be repaired this year for want of funds.
31	Do.	2,181	653	190	In fair order.
32	Do.	1,960	476	190	On stock; could not be repaired this year for want of funds.
33	Do.	1,960	800	190	
34	Do.	1,960	476	190	
35	Do.	400	181	190	
36	Do.	400	319	190	
37	Do.	250	..	190	
	Special repairs	..	105		In fair order.
38	Iron punt	1,400	240	190	
	Special repairs	..	23		
41	Do.	4,063	1,868	265	
42	Do.	4,171	1,902	265	
43	Iron punt	4,242	1,944	265	In good order.
	Special repairs	..	88		
77	Ajax (hull of old dredger No. 9).	839	587	..	Lying idle and being corroded. Should be sold or broken up and materials used for constructing trap punts.
	Total, Iron Punts ..	1,00,746	25,600	* 11,180	
17	Circular trap punt	1,200	1,582	170	In good order.
39	Iron punt, small	250	139	50	In fair order.
40	Trap punt, iron	3,652	1,703	220	In fair order.
	Special repairs	..	849		
	Total ..	3,652	2,552	220	

		RS.
* Maintenance	.. ..	9,180
Special repairs	.. ..	2,000
	Total ..	11,180

PART II.—*Boats and Punts*—cont.

Present registered numbers.	Details of plant. Description of boats.	Value of plant. Original.	Value of plant. Present book value.	Probable cost of upkeep for 1895–96.	Remarks.
		RS.	RS.	RS.	
..	Anicut paddle boat "Violet" ..	900	— 80	150	In fair order.
..	Anicut pinnace	224	203	55	In fair order.
44	Composite punt	2,500	— 723	300	Very weak; requires strengthening.
	Special repairs	..	..	250	
45	Composite punt	2,500	— 642	300	
	Special repairs	..	..	250	
46	Composite punt	2,500	160	300	Very weak; requires strengthening.
	Special repairs	..	203	250	
47	Composite punt	2,288	262	300	Has been strengthened this year and is in perfect order.
	Special repairs	..	148		
48	Composite punt	2,287	309	300	Very weak; requires strengthening.
	Special repairs	..	10	250	
49	Composite punt	2,287	80	300	Has been strengthened this year and is in perfect order.
50	Do.	2,160	349	300	
	Special repairs	..	46		
51	Composite punt	2,160	913	300	Very weak; requires strengthening.
	Special repairs	..	..	250	
52	Composite punt	2,160	264	300	
	Special repairs	..	145	250	
53	Composite punt	2,160	372	300	
	Special repairs	..	..	250	
54	Composite punt	2,055	219	300	
	Special repairs	..	..	250	
55	Composite punt	1,900	160	300	
	Special repairs	..	551	250	
56	Composite punt	2,013	606	300	
	Special repairs	..	314	250	
57	Composite punt	2,075	518	300	Has been strengthened this year and is in perfect order.
	Special repairs	..	142		
58	Composite punt	2,085	490	300	Very weak; requires strengthening.
	Special repairs	..	444	250	
59	Composite punt	2,156	487	300	
	Special repairs	..	46		
60	Composite punt	2,064	436	300	Has been strengthened and is in perfect order.
61	Do.	2,168	492	300	Very weak; requires strengthening.
	Special repairs	..	96	250	
62	Composite punt	2,169	492	300	
	Special repairs	..	..	250	
63	Composite punt	2,164	496	300	
	Special repairs	..	118	250	
64	Composite punt	2,266	552	300	
	Special repairs	..	142	250	
65	Composite punt	2,238	579	300	
	Special repairs	..	..	250	
66	Composite punt	3,000	— 503	330	
	Special repairs	..	95	300	
67	Composite punt	3,000	— 510	330	Has been strengthened this year and is in perfect order.
	Special repairs	..	17		
68	Composite punt	3,000	640	330	
	Special repairs	..	159		
69	Composite punt	2,600	540	330	Very weak; requires strengthening.
	Special repairs	..	187	300	
70	Composite punt	2,600	— 115	330	
	Special repairs	..	..	300	
71	Composite punt	2,600	310	330	
	Special repairs	..	78	300	
72	Composite punt	2,600	330	330	
	Special repairs		58	300	
73	Composite punt	2,600	580	330	Has been strengthened this year and is in perfect order.
74	Do.	2,600	535	330	Very weak; requires strengthening.
	Special repairs	..	209	300	
75	Composite punt	3,811	1,486	330	
	Special repairs	..	..	300	
76	Composite punt	2,553	729	330	
	Special repairs	..	47	300	
	Total ..	79,319	14,088	* 16,630	

		RS.
* Maintenance	.. ..	10,230
Special repairs	.. ..	6,400
	Total ..	16,630

Staff Boats.

Present registered numbers.	Description of boats.	Date of measurement.	Measurement of plant. Hull over all. Length.	Breadth.	Depth.	When loaded.	Tonnage according to navigation rule measurement.	Original.	Present book value.	Probable cost of upkeep for 1895–96.
								RS.	RS.	RS.
11	Staff boat	..	..	..	..	..	..	1,621	262	190
12	Do.	..	..	..	..	..	..	1,621	166	190
14	Do.	..	..	..	..	..	..	1,355	113	160
15	Do.	..	..	..	..	..	..	1,963	712	190
16	Do.	..	..	..	..	..	..	1,556	518	160
	Special repairs	..	..	..	..	..	..	..	46	..
17	Staff boat	..	..	..	..	..	..	990	344	160
18	Do.	..	..	..	..	..	..	2,486	2,072	190
	Special repairs	..	..	..	..	..	..	..	82	.
19	Staff boat	..	..	..	..	..	..	1,815	1,815	160
20	Do.	..	..	..	..	..	..	2,271	2,271	190
21	Do.	..	..	..	..	..	..	1,721	1,721	160
	Superintending Engineer's office camp clerk's boat	..	..	..	..	..	..	359	329	90
	Special repairs	..	..	..	..	..	..	..	66	..
	Total ..	..	..	..	..	..	..	17,758	10,517	* 1,840

		RS.
* Maintenance	.. ..	1,840
Special repairs	.. ..	..
	Total ..	1,840

REMARKS.—All these boats are in fair working order.

ABSTRACT showing the comparison of details between the estimated maintenance cost of floating plant in Kistna district for 1894–95 and 1895–96.

—	Numbers. 1895–96.	Numbers. 1894–95.	Original value. 1895–96.	Original value. 1894–95.	Book value. 1895–96.	Book value. 1894–95.	Cost of upkeep. 1895–96.	Cost of upkeep. 1894–95.
			RS.	RS.	RS.	RS.	RS.	RS.
Steamers	1	1	13,131	13,131	4,902	4,584	4,510	2,510
Dredges	5	5	97,357	97,357	— **26,466**	— **11,974**	3,675	3,560
Iron punts	41	41	1,00,746	1,00,746	25,600	33,856	11,180	* 9,150
Composite punts ..	33	33	79,319	79,319	14,088	18,767	16,630	10,630
Iron punt, small ..	1	1	250	250	139	164	50	50
Trap punt	1	1	3,652	3,652	2,552	2,068	220	220
Circular trap punt ..	1	1	1,200	1,200	1,582	1,702	170	170
Anicut paddle boat "Violet"	1	1	900	900	— **80**	10	150	150
Pinnace for Anicut Superintendent	1	1	224	224	203	225	55	55
Staff boats	11	8	17,758	11,951	10,517	5,512	1,840	1,505
Total ..	96	93	3,14,537	3,08,730	33,037	54,914	38,480	28,000

* Inclusive of scouring dam which has now been shown under iron punts.

Detailed approximate estimate of the annual cost of maintenance of Irrigation floating plant in Kistna district during the year 1895–96.

—	Steamer "Alexandria."	Dredges Nos. 1 and 2 at Rs. 480 each.	Dredge No. 5 at Rs. 670.	Cockburn's dredger.	Iron punts Nos. 1 to 15 and 18 to 27 at Rs. 245 each.	Iron punt No 16.	Iron punt No. 17, circular trap punt.	Iron punts Nos. 28 to 38 at Rs. 190 each.	Iron punt No. 39, small.	Trap punt, iron, No. 40.
1	2	3	4	5	6	7	8	9	10	11
	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.
Docking and launching ..	30	16	16	16	15	8	15	15	8	15
Painting	84	42	70	32	32	23	49	28	14	47
Caulking	28	22	90	33	38	25	20	22	..	25
Tarring	..	33	25	16	16	11	21	10	6	20
Stoker	36	..	..	..	..	..	..	..	..	..
Sarang	75	53	53	..	..	..	..	..	..	..
Lascars	107	80	90	64	4	4	8	4	4	24
Ropes	15	8	8	8	5	5	5	5	4	5
Sundry repairs	200	132	189	68	94	65	23	73	5	46
Miscellaneous	50	14	14	13	..	..	..	..	..	..
Centage and contingencies.	135	80	115	50	41	29	29	33	9	38
Expenses for use by departmental officers	750	..	..	..	..	..	..	..	..	..
Total ..	1,510	480	670	300	245	170	170	190	50	220

—	Iron punts Nos. 41 to 43 at Rs. 265 each.	Composite punts Nos. 44 to 65 at Rs. 300 each.	Composite punts Nos. 66 to 67 at Rs. 330 each.	Ajax No. 77.	Aniout paddle boat.	Aniout pinnace.	Superintending Engineer's camp office boat.	Staff boats Nos. 11, 12, 15, 18 and 20 at Rs. 190 each.	Staff boats Nos. 14, 16, 17, 19 and 21 at Rs. 160 each.
	12	13	14	15	16	17	18	19	20
	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.
Docking and launching ..	15	24	24	..	6	5	4	15	10
Painting	45	..	..	.	33	9	..	..	..
Caulking	40	99	107	28	28	14	21	66	55
Tarring	21	..	..	..	3	3	6	10	8
Stoker	..	..	..	..	..	..	..	..	..
Sarang	..	..	..	..	..	..	..	..	..
Lascars	4	8	8	96	4	..	8	21	21
Ropes	5	5	5	10	5	2	6	12	10
Sundry repairs	90	110	129	18	44	12	28	32	30
Miscellaneous	..	..	..	..	..	..	..	..	..
Centage and contingencies.	45	54	57	33	27	10	17	* 34	* 26
Expenses for use by departmental officers	..	..	..	..	..	..	..	..	..
Total ..	265	300	330	185	150	65	90	190	160

* Increase due to omission of centage for Workshop work in the statement printed last year.

The increase in the estimated cost of upkeep of iron punts is due to the omission of iron work under sundry repairs in the statement prepared last year.

No. 1863 K.S.

Forwarded to the Chief Engineer for Irrigation.

2. Ajax No. 77, which is lying idle, may be sold or broken up and the materials used for constructing trap punts. The necessary sanction is therefore applied for.

3. The items in the statement against which *minus* values are entered will be revalued and the necessary orders have been given for this to be done.

(Signed) W. L. C. BADDELEY, Major, R.E.,
Superintending Engineer, II Circle.

12th November 1894.

No. 142 I.

Submitted to Government. In his budget estimates for 1895–96 the Superintending Engineer, II Circle, has applied for the following grants :—

	RS.
Maintenance of floating plant	20,000
Special repairs to do.	6,000
Charges on account of steamer used by Public Works Department officers	800
Total ...	26,800

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Chief Engineer for Irrigation.

20th Nov. 1894.

ORDER—dated 28th November 1894, No. 933 I., Public Works.

The estimate, amounting to Rs. 38,480, for the maintenance of the floating plant of the Kistna delta system for 1895–96, including Rs. 12,900 for special repairs, is approved; Rs. 26,800 will be provided on this account in the budget estimates for Major Works for next official year.

2. The proposal to break up the "Ajax"—hull of old dredger No. 9—and use the materials for the construction of trap punts is also approved.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
„ Superintending Engineer, II Circle.
„ Examiner, Public Works Accounts.

IRRIGATION.
ACCOUNT.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated November, 28th.

Recd. *Encl.*

G.O., 28th Nov. 1894, No. 933 I.

NOVEMBER.

Floating Plant

Orders approving the estimate of Rs. 38,480 for the maintenance of the — of the Kistna delta system for 1895-96.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following paper :—

From A. S. RUSSELL, Esq., Executive Engineer, Buckingham Canal Division, to the Superintending Engineer, II Circle, dated 4th October 1894, No. 1626.

With reference to this office No. 1295,* dated 15th ultimo, I have the honour to submit, for sanction, the undermentioned estimate duly prepared in accordance with general type design submitted :—

* *Superintending Engineer's remark.*

Sent to Chief Engineer for Irrigation with this office endorsement No. 196 B.C., dated 1st September 1894.

	RS.
Constructing a tidal lock at the Covelong south flood-gate amounting to	11,300

2. The amount of this estimate can be met from reserve at the disposal of Government.

ENCLOSURE.

SKELETON report to accompany estimate for constructing a tidal lock at Covelong south flood-gate.

	RS.
Amount of estimate	11,300

2. *Design.*—The design for this lock is the same as the general type plan for tidal locks submitted with this office No. 1295, dated 15th August 1894.

3. *Principal levels.*—The principal levels are as follows :—

M.S.L.	20·00
H.S.T.	21·60
L.R.T.	19·10

Coping to walls or height of lock = H.S.T. + 6 inches = 22·10.

Sill	14·60
Floor	13·85

Height of walls from sill to coping = (22·10 — 14·60) = 7·50.

4. *Batter.*—Batter for walls 1 in 4 or 1′ 10½″ at base.

5. *Sill.*—The sill of lock to be 4·50 feet below L.R.T. or on the same level as sill of existing flood-gate. The sill of existing flood-gate will be raised 6″ for additional gate to abut against, instead of the old sill being lowered, as originally proposed in general type report, for the reasons stated in this office No. 1378, dated 28th August 1894, and approved by Superintending Engineer in his No. 204 B.C., dated 7th September 1894.

6. *Wings.*—The width of wings in superstructure at base will be 3′ 4½″, and the full width of masonry platform at the heel post will be 5′ 4½″. The length of wings in superstructure will be one and a-half times the height, and is equal to 12′ 9″.

7. *Existing flood-gate.*—The height of existing flood-gate from old sill to coping level is (26·16 — 14·16) = 12 feet. It will be observed that no less than Rs. 5,488, or nearly one-half total cost of estimate, is for gates, there being no gates available for transfer to this lock.

General.—All other particulars in regard to construction can be gathered from the general report that accompanied the general type plan.

No. 273 B.C.

Forwarded to the Chief Engineer for Irrigation for favour of obtaining the sanction of Government to the estimate from the balance available for unforeseen works of the Buckingham canal.

(Signed) W. L. C. BADDELEY, Major, R.E.,
Superintending Engineer, II Circle.

3rd November 1894.

ORDER—dated 28th November 1894, No. 936 I., Public Works.

The following estimate is sanctioned from the balance of the amount reserved for unforeseen works of the Buckingham canal, which will then be reduced to Rs. 1,16,615 :—

Irrigation.
43. Minor Works and Navigation.
Minor Works for which Capital and Revenue Accounts are kept.
Buckingham Canal.
Capital Account.
I. Works.
2. Main Canals and Branches.
9. Navigation Works.

	RS.
Constructing a tidal lock at Covelong south flood-gate, estimate ...	11,300

2. This sanction is registered as No. 123 I. of 1894–95.

(True Extract.)

(Signed) R. R. E. DRAKE-BROCKMAN, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer for Irrigation.
„ Superintending Engineer, II Circle.
„ Examiner, Public Works Accounts.
„ Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1894} Madras.

PUBLIC WORKS.

Dated November, 28th.

Recd. *Encl.*

G.O., 28th Nov. 1894, No. 936 I.

NOVEMBER.

Tidal Lock

Estimate of Rs. 11,300 for constructing a — at Covelong south flood-gate, Buckingham canal, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

TABULAR STATEMENT OF MISCELLANEOUS PROCEEDINGS AND MATTERS OF ROUTINE,

IRRIGATION,

FOR THE MONTH OF NOVEMBER 1894.

Subjects.	Number and Date of Order.	Numbers and Dates of previous Orders.
Objectionable items statement.—Orders on the — in the account of Executive Engineers remaining unremedied to end of July 1894, V Circle.	1st Nov. 1894, No. 832 I.	4th Oct. 1894, No. 732 I. 17th Sept. 1894, No. 680 I. 21st Aug. 1894, No. 603 I. 31st July 1894, No. 563 I.
Objectionable items statement.—Orders on the — in the accounts of Executive Engineers remaining nuremedied to end of July 1894, I Circle.	1st do. do. No. 833 I.	15th Sept. 1894, No. 678 I. 4th Nov. 1893, No. 939 I. 4th Sept. 1894, No. 636 I.
Minor channel for the Bantumilli main distributary.—Directing that the sum of Rs. 3,150 provided for the — be added to the balance available for nuforeseed works of the Kistna Delta system.	8th do. do. No. 863 I.	11th Oct. 1893, Nos. 857–58 I.
Administration report of the Public Works Department of the Bombay Presidency relating to irrigation works.—Copy of the — for the year 1893–94, communicated to the Chief Engineer for Irrigation and Superintending Engineers.	8th do. do. No. 864 I.	17th Nov. 1893, No. 998 I. 21st Sept. 1892, No. 859 I.
Objectionable items statement.—Orders on the — in the accounts of Executive Engineers remaining unremedied to end of July 1894, VI Circle.	10th do. do. No. 867 I.	16th Oct. 1894, No. 769 I. 4th Sept. 1894, No. 637 I. 5th Sept. 1894, No. 640 I. 6th Nov. 1893, No. 954 I. 26th Sept. 1894, No. 713 I.

Subjects.	Number and Date of Order.	Numbers and Dates of previous Orders.
Lands required for the Nellore tank supply channel.—Notification for the acquisition of certain —, ordered to be published in the *Fort St. George Gazette.*	10th Nov. 1894, No. 868 I.	......
Side channel.—Telegrams from certain ryots of Satyamangalam taluk protesting against the introduction of a — in their villages, recorded.	12th do. do. No. 871 I.	......
Divisional objectionable items statement.—Orders on the — for August 1894, No. I Periyár division.	12th do. do. No. 872 I.	17th Oct. 1894, No. 2616 W. 26th Sept. 1894, No. 2416 W. 30th Oct. 1893, No. 3505 C. 18th Sept. 1893, No. 2386 W. 25th July 1893, No. $\frac{1927}{A}$ W. 19th Oct. 1894, No. 779 I. 19th Oct. 1894, No. 778 I. 25th June 1894, No. 486 I. 8th Sept. 1894, No. 653 I. 10th Sept. 1894, No. 659 I.
Land required for the 13th distributary, Rushikulya project, Ganjám district.—Notification for the acquisition of certain —, ordered to be published in the *Fort St. George Gazette.*	12th do. do. No. 873 I.	10th Jan. 1894, Nos. 13-14 I.
Lands required for certain works connected with the Kistna delta system.—Notification for the acquisition of certain —, ordered to be published in the *Fort St. George Gazette.*	12th do. do No. 874 I.	9th Feb. 1894, No. 109 I. 9th Feb. 1885, No. 124 I.
Kistna new head sluice.—Government of India informed by telegram of the amount required for — and for other urgent works under "49," and that nothing is wanted under "42," and a copy of the proceedings ordered to be forwarded to the Government of India.	12th do. do. No. $\frac{874}{A}$ I.	25th Oct. 1894, No. 817 I.
Forwarded	12th do. do. No $\frac{874}{B}$ I.	
Lands required for certain irrigation works, Gódávari district.—The Sub-Collector of the Gódávari district directed to procure the occupation and use of certain — for a period not exceeding three years from date of occupation.	13th do. do. No. 875 I.	14th June 1888, No. 350 I.
Lands required for public purposes in connection with the Upper Sagileru project, Cuddapah district.—Notification for the acquisition of certain —, ordered to be published in the *Fort St. George Gazette.*	13th do. do. No. 876 I.	9th Jan. 1894, No. 10 I.
Land required for protecting the Mudikondan left bank, Tanjore district.—Notification for the acquisition of certain —, ordered to be published in the *Fort St. George Gazette.*	13th do. do. No. 877 I.	......

Subjects.	Number and Date of Order.	Numbers and Dates of previous Orders.
Objectionable items statement.—Orders on the — in the accounts of Executive Engineers remaining unremedied to end of July 1894, IV Circle.	13th Nov. 1894, No. 878 I.	15th Oct. 1894, No. 764 I. 15th Sept. 1894, No. 677 I. 4th Sept. 1894, No. 635 I. 3rd Aug. 1894, No. 570 I.
Sathuvachary river channel.—Rs. 660 withdrawn from the grant sanctioned for improvements to — in the North Arcot division and credited to the reserve under "Minor Works, Revenue Department — "Original Works."	13th do. do. No. 879 I.	21st Sept. 1894, No. 695 I.
Lands required for the Neelanagaram channel, Vizagapatam district.—The Principal Assistant Collector, Vizagapatam district, directed to procure the occupation and use of the — for a period not exceeding three years from date of occupation.	13th do. do. No. 880 I.	......
Land required for closing breaches in the Gódávari left embankment.—The Sub-Collector of the Gódávari district directed to procure the occupation and use of the — for a period not exceeding three years from date of occupation.	13th do. do. No. 881 I.	......
Land required for river protection works, Gôdávari district.—Notification for the acquisition of certain —, ordered to be published in the *Fort St. George Gazette.*	13th do. do. No. 882 I.	......
Land required for the flood bank of Venkatasamudram anicut channel, Madura district.—Notification for the acquisition of certain —, ordered to be published in the *Fort St. George Gazette.*	13th do. do. No. 883 I.	......
Lands required for certain irrigation works in the Nellore district.—Notification for the acquisition of certain —, ordered to be published in the *Fort St. George Gazette.*	14th do. do. No. 887 I.	16th March 1892, No. 261 I.
Land required for Chirivada channel, Kistna district.—Notification for the acquisition of certain —, ordered to be published in the *Fort St. George Gazette.*	14th do. do. No. 888 I.	13th March 1893, No. 226 I. 9th Feb. 1885, No. 124 I.
Lands required for certain irrigation works in the Nellore district.—Notification for the acquisition of certain —, ordered to be published in the *Fort St. George Gazette.*	14th do. do. No. 889 I.	20th Oct. 1892, Nos. 881–82 I. 3rd July 1891, No. 539 I.
Objectionable items statement.—Orders on the — in the accounts of Executive Engineers remaining unremedied to end of July 1894, II Circle.	15th do. do. No. 894 I.	7th May 1894, No. 373 I. 23rd Oct. 1894, No. 801 I. 2nd Oct. 1894, No. 720 I. 1st June 1893, No 481 I. 20th Aug. 1894, No. 596 I. 24th May 1894, No. 413 I. 18th Sept. 1894, No. 681 I.

Subjects.	Number and Date of Order.	Numbers and Dates of previous Orders.
Objectionable items statement.—Orders on the — in the accounts of Executive Engineers remaining unremedied to end of July 1894, III Circle.	16th Nov. 1894, No. 900 I.	23rd Oct. 1894, No. 802 I. 21st Sept. 1894, No. 693 I. 18th Aug. 1894, No. 591 I. 2nd Aug. 1894, No. 569 I. 30th May 1894, No. 424 I. 10th Sept. 1892, No. 772 I. 11th April 1894, No. 331 I.
Lands required for Thorappadi channel, North Arcot district.—Notification for the acquisition of certain —, ordered to be published in the *Fort St. George Gazette*; and the Collector of North Arcot directed to state the designation of the officer who is to be authorised to procure the use of the lands required for temporary occupation.	16th do. do. No. 901 I.	......
Objectionable items statement.—Orders on the — in the accounts of Executive Engineers remaining unremedied to end of July 1894, I Circle.	16th do. do. No. 906 I.	1st Nov. 1894, No. 833 I. 21st Aug. 1894, No. 598 I. 5th Oct. 1894, No. 736 I. 15th Sept. 1894, No. 678 D. 4th Sept. 1894, No. 636 I.
Land required for public purpose, Chingleput district.—Notification for the acquisition of certain —, ordered to be published in the *Fort St. George Gazette.*	20th do. do. No. 911 I.	......
Land required for raising the left embankment of the Kistna river.—Notification for the acquisition of certain —, ordered to be published in the *Fort St. George Gazette.*	20th do. do. No. 912 I.	28th March 1893, No. 278 I.
Lands required for the Maldevi drain, Nellore district.—Notification for the acquisition of certain —, ordered to be published in the *Fort St. George Gazette.*	20th do. do. No. 913 I.	3rd July 1891, No. 539 I.
Land required for the extension and banking of the old Coleroon in Chidambaram taluk, South Arcot district.—Notification for the acquisition of certain —, ordered to be published in the *Fort St. George Gazette.*	20th do. do. No. 914 I.	7th Nov. 1894, No. 3482 C. 8th Oct. 1892, No. 835 I.
Lands required for public purposes in Badvel taluk, Cuddapah district.—Orders directing the General charge Deputy Collector, Sidhout division, to procure the occupation and use of the —, for a period not exceeding three years from date of occupation.	23rd do. do. No. 921 I.	31st Oct. 1894, No. 831 I. 9th Jan. 1894, No. 10 I.
Rushikulya canal.—The Examiner, Public Works Accounts, authorised to pass the excess expenditure incurred on the maintenance of the —.	23rd do. do. No. 922 I.	......

Subjects.	Number and Date of Order.	Numbers and Dates of previous Orders.
Budget estimate.—Proceedings, Financial Department, accepting — of Minor Irrigation works in charge of Civil officers for 1895–96, communicated to the Chief Engineer for Irrigation.	23rd Nov. 1894, No. 923 I.	......
E. Form Progress Reports of No. I Periyár and Madura (No. II Periyár) divisions.—Ordered that copies of the — for October 1894, be forwarded to the Government of India.	26th do. do. No. 925 I.	31st Oct. 1894, Nos. 825–26 I. 27th Sept. 1894, Nos. 716–17 I.
Forwarded	26th do. do. No. 926 I.	......
Land required for the Pornakondapuram Tank Project, Salem district.—Notification for the acquisition of certain —, ordered to be published in the *Fort St. George Gazette.*	27th do. do. No. 931 I.	......
Lands required for constructing sheds in the Periyár 10th Branch channel, Madura district.—The Collector of Madura directed to procure the occupation and use of the —, for a period not exceeding two years from date of occupation.	28th do. do. No. 934 I.	15th Dec. 1893, No. 3258 W.
Trees on Irrigation Works.—Directing that certain alteration be made in line 2, clause C, paragraph 2 of letter, No. 330 M., dated 21st June 1894, from the Chief Engineer for Irrigation, printed in G.O., No. 527 I., dated 14th July 1894, approving the transfer to the Revenue Department of all — under the charge of the Public Works Department.	28th do. do. No. 935 I.	11th July 1894, No. 527 I.
Land required for the water-spread of Kilakkulam tank, Madura district.—Notification for the acquisition of certain —, ordered to be published in the *Fort St. George Gazette.*	28th do. do. No. 937 I.	......
Land required for certain works connected with the Kistna delta works.—Notification for the acquisition of certain —, ordered to be published in the *Fort St. George Gazette.*	28th do. do. No. 938 I.	......
Funds.—Proceedings, Revenue Department, requesting the Financial Department to place an additional allotment of Rs. 320 from Irrigation-cess fund at the disposal of the Public Works Department for expenditure during the current year in the Trichinopoly division, communicated to the Superintending Engineer, VI Circle.	28th do. do. No. 939 I.	......
Irrigation Works in the Madras Presidency.—The Government of India informed by telegram of the total area irrigated by all classes of —.	30th do. do. No. 940 I.	22nd Sept. 1877, No. 339 I.